Indian Institute of Foreign Trade

SURVEY
of
INDIA'S EXPORT POTENTIAL
of
FRESH AND PROCESSED FRUITS AND VEGETABLES

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SURVEY
OF
INDIA'S EXPORT POTENTIAL
OF
FRESH AND PROCESSED FRUITS AND VEGETABLES

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GENERAL REVIEW

1. GENERAL REVIEW

Background

Endowed with diverse geographical and climatic conditions, India produces numerous varieties of fruits and vegetables, tropical as well as temperate. The annual production of fruits and vegetables is estimated at over 20 million tonnes. In recognition of the importance of production of fruits and vegetables as a valuable supplement to the food resources of the country and as a sector offering considerable export potential, increasing attention has been paid in the recent years to gear up this industry to achieve these dual objectives. The progress so far achieved in the sphere of production and exports, however, has been unimpressive.

India's exports of fresh fruits and vegetables amounting to 109,932 tonnes valued at $ 6.5 million during 1967-68, represent but an insignificant fraction of the total production. Of the total exports, onions alone account for about 93%. The performance of the Indian horticultural processing industry has been reckoned at 47,180 tonnes valued at $ 22.2 million. It would, thus appear that a very small proportion of the total fresh produce available in the country is given over for processing, average share of processing being 0.3% of total fresh produce. Exports of processed fruits and vegetables amounted to a mere 6,189 tonnes valued at $ 2.5 million during 1967-68 as against the world total trade of $ 2 billion. (Annexure A). India's experience in the field of export marketing of fruits and vegetables is limited and against the vast potential available in the world markets for fresh as well as processed fruits and vegetables, there is a need to evolve effective measures for strengthening the horticultural base and developing appropriate marketing machinery for building up a sizable export trade.

World Trade Pattern

International trade in fruits and vegetables - both fresh and processed - is of vast dimension, total world trade being reckoned at $ 7 billion, comprising $ 5 billion worth of fresh fruits and vegetables and $ 2 billion for processed fruits and vegetables. Major fresh fruits and vegetables entering world trade include bananas, citrus fruits, apples, grapes, onions, tomatoes and pears and canned fruits like peaches, pineapples, pears and apricots, fruit juices and citrus and tomato products among processed products. World imports of fresh fruits and vegetables amounted to 12.4 million tonnes of fruits and 16.5 million tonnes of vegetables during 1965. Among fresh fruits bananas constitute the largest item, total imports having amounted to 4.6 million tonnes or 33% of the total, followed by citrus fruits with a total import of 4.5 million tonnes. Other important fruits entering world market include apples, grapes and pears. Among vegetables, onions represent the largest item with over 55% of the total imports followed by potatoes and tomatoes.

An idea of the dimension of the world processing industry can be had from the fact that the total output of canned fruits is currently of the order of 4 million tonnes, output of fruit juices being in excess of 1 billion gallons on single strength basis. Peaches account for 25% of the total production of canned fruits and 50% of the output of juices comprise citrus. It has been estimated that about 1 million tonnes of canned fruits (20% being peaches) and 100 million gallons of fruit juices (50% comprising citrus) enter world trade. Other items participating in world trade in a significant way include pineapples, pears, apples, apricots, fruit cocktails and citrus segments.

Demand. West Europe is the chief consuming market for fresh fruits and vegetables. Although West Europe itself constitutes an important producer of apples, oranges and other deciduous and citrus fruits, most of the countries, including West Germany, UK, Netherlands and Scandinavia import considerable quantities of these fruits as well as bananas. Despite attempts made for achieving self-sufficiency in deciduous fruits particularly apples, the demand potential available in these countries continues to be substantial necessitating imports. Total world imports of major fresh fruits and vegetables amounted to 12.4 million tonnes and 16.5 million tonnes during 1965 respectively, total value being $ 2.6 million. It is noteworthy that of the total imports of 4.5 million tonnes of citrus fruit in 1965, West Europe and UK absorbed 2.7 million tonnes, the remaining having been consumed in the countries of East Europe, Oceania, South East Asia and West Asia. Out of the total world imports of 5.2 million tonnes of bananas during 1967, Western Europe accounted for 2.4 million or 46% of the total. Total imports of deciduous fruits comprising apples, pears, plums, cherries, peaches and apricots, amounted to 2.2 million tonnes, Western Europe having accounted for 1.6 million tonnes, million tonnes or 72% of the total. The position in respect of vegetables including potatoes, onions and tomatoes was also similar, West European imports being in the neighbourhood of 50% of total world imports. Of the total imports of canned fruits of 1.2 million tonnes in 1966, West Europe absorbed 849,700 tonnes or about 76% of the total. It is thus apparent that about 50% of the total imports of fresh fruits and vegetables and 75% of processed items is consumed in Western Europe reflecting the importance of this region.

Besides West Europe, the other important consuming markets include Americas, Oceania, East Europe and Asia, their individual shares in the total trade, however, having been small as compared to the West European demand for these items.

It might be pertinent to mention here that because of the climatic restraints, the countries of West Europe are not in a position to grow even temperate fruits throughout the year thus necessitating large imports during off-season periods. Further, the absence of production of fruits like bananas and pineapples, in most of the European countries makes the imports of these items inevitable. Another factor contributing to the increasing demand for imported produce relates to the rising personal incomes; eating habits in Europe are undergoing rapid changes and a shift towards the consumption of newer fruits and vegetables is very much in evidence. The growing consumption of exotid fruits like avocado pears, mangoes and lychees is a case in point. In the UK market, for instance, Israeli stakes have risen very high in avocado pears and the trade predicts an impending delicatessen boom in the country.

The Survey countries, particularly in Europe, represent the most vital area of demand concentration of fruits and vegetables in the world. Despite considerable domestic production, they have been importing substantial quantities of fruits and vegetables from European as well as non-European countries. Total imports of the twelve Survey countries of West Europe including Yugoslavia amounted to 7.7 million tonnes of fresh fruits and 5.6 million tonnes of fresh vegetables during 1964-66 period representing approximately 41% of the total world trade in fruits and vegetables. An idea about the significance of these countries as consuming markets can be had from the following table:

Imports of Surveyed Countries[1]

(Thousand Tonnes)

	Fruits		Vegetables	
	Fresh	Processed	Fresh	Processed
Europe				
West Germany	2,933	368	2,147	218
France	1,568	103	813	18
UK	1,436	511	1,027	185
Netherlands	386	82	175	38
Belgium-Luxemburg	337	49	386	43
Switzerland	334	22	170	30
Sweden	296	40	154	11

(Contd. next page)

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[1] Basic Statistics on Fruits and Vegetables of the Survey Countries, Volume III and IV, of the Report.

	Fruits		Vegetables	
	Fresh	Processed	Fresh	Processed
Italy	210	13	320	11
Denmark	125	29	28	35
Total (including others)	7,726	1,217	5,568	582
West Asia				
Kuwait	51	4	50	10
Iraq	32	1	91	11
Total (including others)	103	5	180	21
South East Asia				
Hong Kong	184	14	285	46
Singapore	145	71	93	-
Malaysia	60	18	49	-
Total (including others)	453	103	384	46

Among the Survey countries, West Germany constitutes the most important market, having accounted for 38% of the total imports of fresh fruits and vegetables followed by UK, France, Netherlands, Switzerland, Belgium-Luxemburg, Sweden and Italy. In respect of South East Asia, only Hong Kong, Singapore and Malaysia offer adequate demand for imported items, other countries like Thailand and Philippines having adequate domestic production. Among the West Asian countries, where the production of fresh fruits and vegetables has been inconsiderable due to climatic constraints, Kuwait, Bahrain and Iraq constitute important markets, Lebanon being a major supplier. In respect of processed items, UK's consumption is the highest, having represented 39% of the total imports of the European Survey countries during 1965, followed by West Germany with 32%. The imports, exports and apparent consumption of fresh and processed fruits and vegetables of survey countries are furnished at Annexure B.

Supply. Important producers and suppliers of fresh and processed fruits and vegetables to world markets are Spain, France, Italy, Greece, Hungary, Bulgaria, and Poland in Europe, Morocco, Algeria, Tunisia, Kenya, Israel, Lebanon and UAR in the Mediterranean region, Taiwan, Malaysia, Philippines and Japan in South East Asia and Far East, Lebanon and Jordan in West Asia and Brazil, Argentina, New Zealand and Australia in the Southern hemisphere. Production in most of these countries has been rising over the past decade on account of the significant developments that have taken place in the horticultural technology as well as the expansion of area under cultivation. It is well known that some of these countries being small do not absorb all their production resulting in the growing importance of exports as vital outlet for their produce (Annexure C).

Mediterranean region, which constitutes the major supplier of different types of fresh fruits and vegetables to the European consuming markets, has been increasing its supplies tremendously over the past few years. The total production of citrus, for instance, in the Mediterranean region was recknoed at 7.4 million tonnes during 1965-66; of this 3.4 million tonnes was exported, Spain having accounted for 2 million tonnes of production and 1.3 million tonnes of exports. The total world production of bananas in 1965 amounted to 23 million tonnes of which over 70% was accounted for by Central America, South America and Caribbean Islands. Out of a total world banana exports of 4.8 million tonnes, North Central America including the countries of Costa Rica, Guatemala, Honduras and Panama accounted for over 2.1 million tonnes of exports, the remaining being shared between South American countries and countries of Asia and Spain. In Europe, Spain is the only producer of bananas with a total production of 390,000 tonnes in 1966, 89,500 tonnes having been exported during that year. Major proportion of the world exports of apples emanates from Canada, Australia, Italy, Bulgaria, South Africa, Argentina and Lebanon; their combined share on an average amounts to 80% of the total world trade. 50% of the total European requirements for apples are met by intra-European trade, the remaining being imported from countries including Argentina, Australia and USA, mainly during off-season period. In the case of apples, Europe s efforts aimed at self-sufficiency have met with adequate success. The intra-European trade in fresh apples has expanded considerably since the War, the bulk of the supplies being provided by Italy, Netherlands, Belgium and France. With a view to protecting the local industry, most of the European countries have imposed specific restrictions on the imports of apples during season, imports being free during off-seasons.

Analysis of the imports of major fruits and vegetables into the Survey countries indicates interesting results signifying the almost monopoly positions held by various suppliers to this important area. Of the total imports of 1.9 million tonnes of bananas in 1965 (total European imports being 2.2 million tonnes), Ecuador, Colombia, Jamaica and Windward Islands together accounted for 1.1 million tonnes or 58% of the total imports, Ivory Coast and Honduras being the other major suppliers. In respect of banana imports into West Asian Survey countries, India constitutes the major supplier with over 45% share of the total imports in 1965 followed by Lebanon and Colombia. Mainland China and Malaysia represent the main suppliers of bananas to the South East Asian countries having accounted for 95% of the total in 1965.

In the case of oranges, the supply is concentrated in the Mediterranean region comprising mainly Spain, Italy and Israel, whose collective stakes in the orange market of European countries under survey were as high as 65%. West Asia's total imports of 1.06 million tonnes of oranges during 1965 were catered to the extent of 80% by Lebanon, the remaining being made up by Jordan. Mainland China is the major supplier of oranges to South East Asian markets (total imports 99,000 tonnes) with 25% share of the total imports, followed by USA with 24% share.

Grape supplies to European survey countries having amounted to 423,000 tonnes in 1965, mainly emanated from Italy (45%), Spain (23%) and South Africa (8%). Imports of grapes into South East Asian and West Asian countries are inconsiderable.

The countries surveyed in Europe imported 1.3 million tonnes of onions in 1965, Netherlands, France, Italy and Spain accounting for the bulk of supplies. In the case of onions, however, countries like UAR and Poland have substantial stakes in the European markets, both having accounted for 142,000 tonnes of onions out of a total imports of 464,000 tonnes during 1965. The trade in items like beans, peas and tomatoes is mostly intra-European.

In respect of canned fruits, supplies mainly emanate from USA, South Africa, Australia, Taiwan, Spain and France. While the fruit juice market is dominated by Israel, Greece, Brazil and France, tomato products are supplied by Italy, Portugal, Bulgaria and France.

It would thus appear from the above that on account of factors including geographical proximity, traditional trade relations and preferential systems, supply like demand is concentrated in a few hands, Mediterranean region being the most important supplier of horticultural produce to the European markets. Geographical proximity seems to be the dominating factor in respect of supplies to South East Asia and West Asia, where Mainland China and Lebanon are the main suppliers respectively.

Investment in organising production in some of the countries for obtaining regular supplies at reasonable prices has assumed importance in recent years in European horticultural trading. By way of mutual tie-up arrangements, European capital has been invested in some of the

North African and Asian countries for the production of such varieties of fruits and vegetables as are required in the consuming markets. For instance, German capital has moved to Costa Rica for the systematic organisation of banana industry for eventual exports to the West German market. It is understood that the West German pool of manufacturers and exporters has floated a company in Costa Rica for organising production of bananas, where they hold over 50% interest in production operations. German capital has also been substantially invested in Kenya and Ethiopia for orderly development of horticultural produce and also the processing industry. Sizable capital of French origin has likewise been invested in Ivory Coast and other Associated Territories of France for the production of various items, including pineapples and tropical fruits and vegetables.

Preferential Systems

In the international fruit and vegetable trade, variety of preferential trade systems operate which are basically aimed at providing favoured position to certain producing countries in the matter of access to the consuming markets. Economic groupings like ECM, EFTA, Commonwealth, Arab Common Market and specific agreements as exist between USA and Philippines are instances which characterise the present day international trading in various items including fruits and vegetables. The implications of these groupings are detailed below:

ECM. In view of the peculiar nature of the industry relating to the wide fluctuations in prices from one area to another, speculative cultivation and perishability of the commodities, it was neither considered feasible nor desirbale to enforce very tight regulations in respect of fruit and vegetable markets in the ECM region. The ECM Decree of April 20, 1962, calls for compulsory application of common standards of quality and setting up of a quality control service so as to ensure their strict enforcement. Lifting of import barriers in trade among member countries and the introduction of a reference price with a view to levying compensatory taxes when the price falls below the reference price, constitute the most important features of fruit and vegetables regulations in ECM countries.

The creation of a common market organisation in the EEC has undergone two distinct phases as under:

i) Setting up of the framework for a common market organisation in the member countries.

ii) Carrying out of the common market organisations within this framework.

The second phase which has already commenced since December 1966 involves i) regulation of trade among EEC countries and ii) provisions of certain measures governing trade with non-EEC countries. In respect of intra-member countries trade, the following steps initiated recently are of significance to the international trade in fruits and vegetables:

i) Introduction of common quality standards for fresh fruits and vegetables.

ii) Gradual elimination of quantitative restrictions, trade barriers, minimum price controls, import control systems and import tariffs in trade among EEC countries.

With regard to the phase dealing with the introduction of a common fruit and vegetable market which has come into effect from January 1967, the following developments need special mention:

i) Obligations of EEC countries to control the quality of import from non-EEC countries so as to ensure that the imported commodities comply with EEC standards or equivalent quality standards.

ii) Introduction of a reference price system aimed at preventing non-EEC countries from marketing their produce in EEC countries at prices below the levels fixed according to the cost of production as existing in the EEC producing areas.

iii) Adjustments of the import tariffs of the individual EEC countries to the common EEC tariff schedule applicable to imports from non-EEC countries.

Besides regulating intra-member trade, EEC has granted preferential treatment to the imports emanating from Greece and Turkey, who by virtue of their agreements enjoy concessional tariff rates, and 18 Associated Countries of Africa who have been accorded full tariff exemptions for their produce shipped to EEC on the condition that the commodities are accompanied by a certificate of origin. As against this, imports from non-EEC countries in general are subject to common EEC tariff schedules determined on the basis of arithmetical mean rates previously spplied by the individual EEC countries. Adjustments of the individual national tariffs to the common EEC schedules have been worked out on a progressive basis, the impact on trade having varied from one country to another. For instance, in the case of high tariff countries like France, the common tariff schedule has resulted in a considerable reduction in tariffs whereas in the low tariff countries like Netherlands, it has led to a substantial rise in tariff rates.

It may be indicated that from July 1, 1968, the EEC has become a unified market in all aspects, all internal duties having been abolished, alignments with the common external tariff completed and a comprehensive common agricultural policy evolved. While under the common external tariff, industrial raw materials are either granted free access or are subject to a low tariff duty, the agricultural products including temperate zone products are protected by guaranteed prices and variable levies.

The Yaounde Convention on association between European communities and the 18 African States having come into force on June 1, 1964 for a period of 5 years, extends to these associates the same duty-free and quota-free treatment as is applied in trade among the member states of the community in respect of products not governed by the common agricultural policy of ECM. The Convention also decided to grant a total financial assistance of $ 730 million to these countries, one-third being set aside for the economic diversification and the organisation of efficient production of suitable items in these countries. A further assistance of $ 13 million is to be diverted to these countries in case world prices of most of the products being exported presently from the associates, fall below the fixed reference prices. The Kennedy Round negotiations did not have any effect on the preferential treatment being extended by ECM to its associate members in respect of tropical and temperate zone fresh and processed agricultural products.

The EEC entered into an agreement with Greece on November 1, 1962 which provides for a full customs union between the EEC members and Greece to be achieved over a transition period of 22 years. The EEC countries had agreed to afford full intra-EEC tariff treatment from July 1, 1968. This has a very advantageous effect on the Greek trade of fresh fruits and vegetables with ECM, which constitutes one of the important customers of Greek produce. Likewise the agreement between Turkey and EEC which came into force on December 1, 1964 provides a full custom union but preceded by a prepratory period of at least 5 years during which time Turkey will have the advantage of reduced tariff rates for its major export commodities including figs, raisins and hazelnuts.

Besides the measures undertaken by EEC as indicated above, certain countries like France have evolved special preferential links; Morocco and Tunisia have such arrangements with France and Libya with Italy. Algeria also enjoys reduced tariff rates in respect of its exports to France and slightly higher rates in other EEC countries. France has accorded special preferential treatment to Morocco and Tunisia on the basis of a protocol to the Treaty of Rome permitting the maintenance of special custom treatment accorded to the exports of these two countries by France. The other countries of EEC have also agreed to conclude such conventions with these two important Meghreb countries. This special treatment relates mainly to the duty-free tariff quotas as fixed by France in respect of imports from these countries. Such arrangements also exist between Israel and Spain for certain special products.

Commonwealth Preferential System. All primary products and most manufactured goods enter the UK market free of duty when imported from the Commonwealth preference area. With the abolition of tariffs on mutual trade particularly on industrial goods among the members of EFTA, the advantages enjoyed by Commonwealth countries have been sealed down in respect of industrial goods. The Commonwealth countries, however, retain preferences for agrioultural products particularly in respect of processed fruit items in so far as goods imported from EFTA countries are not duty-free. For all practical purposes the imports of horticultural produce coming into UK from Commonwealth countries are exempt from any duty.

Arab Common Market. The five Arab countries including UAR, Jordan, Iraq, Kuwait and Syria have established a common market for regulating free trade smongst them, from January 1, 1965. Intra-member trade being exempt from any duties, Lebanon and Jordan have been enabled to build up substantial business in horticultural products in the Arab markets.

It would be apparent from the above analysis that strong economic groupings recently formed in the world for favouring imports from certain countries by grant of preferential treatments or exemption from duty have rendered access to these markets difficult. It, however, needs to be mentioned that despite these regulations, ECM countries have to rely upon supplies from non-member countries due to restricted production of various items like citrus, bananas and other tropical fruits as well as the absence of production of numerous other items. For instance, during 1963-65 period, Italy met merely 5% of the total citrus requirements of EEC countries whereas 91% was accounted for by supplies from non-EEC European countries and 5% by other citrus growing countries. It is clear that Italy could not meet a sizable proportion of the market requrements of EEC countries for citrus fruits. (With a total production 1,320,000 tonnes in 1966-67, Italy exported merely 100,000 tonnes to member countries and 140,000 tonnes to non-member countries, major proportion of the production being considered unsuitable for export.) Despite EEC's refusal to grant preferential treatments to other citrus growing areas, the consumers in these countries do not display any intention of following the EEC suggestions to consume more of the EEC deciduous fruits than non-EEC citrus fruits. Though high seasonal tariffs are imposed on imports from third countries, EEC consumers continue to express a strong demand for oranges emanating from Spain, Israel and Morocco. In respect of bananas the position is obvious where no EEC member has any production base for the growth of bananas, reliance on overseas suppliers being inevitable.

Kennedy Round Negotiations. It is now increasingly being realised that high tariff walls imposed by ECM and other economic groupings have not succeeded in checking imports from third countries in any significant manner, supplies from outside world having continued unabated on account of the growing consumption of fruits and vegetables in the consuming markets of the world. Efforts to lessen the impact of such preferential trading practices on the exports of horticultural commodities of the developing coountries have already met with considerable success as is evident from the fact that major consuming countries like USA, UK, Japan, Canada and the countries of European Economic

Community have agreed to offer varying degrees of concession under Kennedy Round negotiations. EEC, for instance, has reduced tariffs on various items including oranges, mandarins and clementines, table pears, peaches, cherries, plums and many processed items. For instance, the tariff duty on oranges has been reduced from 15% to 14% during April and October and that on apples from 14% to 13%.

Duty on onions in ECM region has also been decreased from the present rate of 12% to 10%. Likewise, UK has effected considerable reductions in its tariff schedules. The new schedule will come fully into force from January, 1972 following a reduction on July 1, 1968 of two-fifth of the total reduction to the final rate, and three further reductions of equal sizes on January 1, 1970, 1971 and 1972. The following table would indicate the reductions agreed to UK:

(Percentage)

Items	Base rate of Duty	Reduction July 1, 1968	1972 Concession Rate
Carrots (November 1 to March 31)	10	2	5
Tomatoes (November 16 to March 31)	10	1	8
Onions	10	2	5
Oranges, Clementines, etc.	10	2	5
Other Citrus	10	2	5
Melons	10	2	5
Other Fresh Fruits	10	2	5

These reductions have provided good impetus for the expansion of international trade in fresh and processed fruits and vegetables, especially for the exports of the developing countries.

Prospects

Despite the high tariffs imposed by consuming markets, striking success achieved by Israel, Taiwan. Malaysia, Philippines, Kenya and Morocco in the field of horticultural exports underline the fact that export opportunities in the world markets are not lacking for those countries who are prepared to meet the exacting requirements of the world markets. East Europe is a case in point which in recent years has been emerging as a major supplier of horticultural produce both fresh and processed to the European markets. West Germany, for example has since recently been absorbing large quantities of these items from East Europe. At present the supplies from East Europe represent 8% of the total horticultural imports of West Germany. The chief items imported from East Europe include onions, tomatoes, peppers, grapes, apples and fresh prunes. West Germany, for instance, covers well over half of its import requirements of fresh prunes and about one-third of its requirements of onions and peppers from East European sources. In respect of tomato products, East European countries like Hungary, Yugoslavia and Bulgaria have improved their positions considerably in the recent past in the European market. Bulgaria particularly has gained a substantial foothold in the tomato products markets of Europe.

These instances clearly indicate the success achieved by countries outside the economic groupings. Significant factors which have led to this trend are mentioned below:

i) Climate is a major constraint in Europe affecting the production of even temperate fruits and vegetables round the year. For instance, apples for which there is a sufficient production base in Europe, have to be imported during off-seasons.

The same is true with respect to grapes, citrus and berries. Imports will, therefore, continue to grow during well defined off-seasons, thus offering adequate prospects to countries better placed climatically. Countries like India which have varied climatic regions, can take advantage of the situation profitably.

ii) Per capita consumption of fruits and vegetables in Europe is growing fast on account of the rising living standards. Consequent to increasing personal incomes, the European consumers are not satisfied with only those fruits which are produced in their countries; they demand and require newer and different products. The growing consumption of items like pineapples is a case in point. French imports of tropical fruits has shown impressive rise in the recent years. The market for exotic tropical fruits like avocados, mangoes, lychees, passion fruits, papayas and Chinese gooseberries has been expanding in France for the past few years. Though the trading in these items is relatively small in comparison with that of fresh bananas and pineapples, imports of these items by the six EEC countries in 1965 was about 1,000 tonnes, France having accounted for 719 tonnes of the total. It would be interesting to note that in 1966 the French imports of these items rose to 1,004 tonnes valued at $ 0.64 million. The quantity may be small when compared to the total French imports of bananas of 2.6 million tonnes but indications suggest a growing consumption of these items in the coming years.

iii) Countries of East Europe, West Asia and South East Asia who till recently consumed very small quantities of imported fruits and vegetables, are emerging as major importing countries of fresh and processed fruits and vegetables especially tropical fruits. USSR, for instance, has been importing considerable quantities of bananas from India and other countries. Exports of fruit juices from India, mainly mango juice, have also been showing remarkable rise in respect of USSR. Countries in South East Asia including Hong Kong, Malaysia and Singapore have considerably increased their imports of these items from the neighbouring countries including Mainland China. The same is true in case of West Asian countries including Kuwait, Saudi Arabia, and Bahrain where because of Arab market regulations, Lebanon has emerged as a major supplier.

Viewed against the above, India's performance in the field of horticultural exports is insignificant. It has hardly made use of the off-seasonal advantage it enjoys in the European markets in respect of certain fruits and vegetables like strawberries, grapes, apples and onions, the geographical proximity to the markets of West Asia and South East Asia, large population of Asian origin in countries like UK and the relatively low labour cost in the country. India's present total production of 20 million tonnes can be expanded considerably if measures suggested in the body of the report are implemented expeditiously. The success achieved by small countries like Israel, Taiwan and South Africa clearly underlines the necessity of organising efficient production and marketing for capturing a greater share of the European markets. Avocado pears which were hardly known in Europe till the Second World War, are exported to the extent of 15,000 tonnes by Israel, mainly to the UK market.

The markets of South East Asia and West Asia on account of the geographical proximity to India constitute the natural markets for Indian horticultural items. Furthermore a familiarity with the tastes of Indian items exists in these countries and given necessary export orientation, the exports of Indian items can be stepped up appreciably. West European markets with the tremendous growth they have shown in the recent past, offer prospects of significant dimension. These markets are however characterised by intensive competition offered by Mediterranean, Central American and North African suppliers, who have made considerable inroads into these markets during the past few years. Notwithstanding this competition, India with its tremendous production base and advantage of climatic conditions favouring the growth of a vast range of fruits and vegetables, can hope to enter these markets in a substantial way, provided steps are taken to organise production and exports in a systematic manner.

TRADE PROSPECTS

2. TRADE PROSPECTS

2.1 FRANCE

Background

France is the third largest importer of fresh fruits and vegetables in Europe, ranking next only to West Germany and UK. During 1965-67, imports of fresh fruits and vegetables averaged 2.38 million tonnes ($ 460 million), major commodities being citrus, bananas, peaches, apricots, tomatoes, etc.

Total imports of processed fruits and vegetables were placed at 121,000 tonnes comprising 103,000 tonnes of fruit preparations, and 18,000 tonnes of processed vegetables during the corresponding period, total value being $ 36 million. The per capita consumption for imported processed items has been showing a steady rise during the past decade and the available indications suggest a continuation of this trend in the coming years.

A. Fresh Fruits and Vegetables

Prospects. India's exports of fresh fruits and vegetables are limited to onions, total exports having amounted to 2,877 tonnes valued at $ 190,266 in 1967-68 and small quantities of mangoes (18 tonnes). Against the large potential offered by France, this performance is unimpressive.

In considering India's export prospects to France, it is essential to take note of French membership in EEC on the one hand and her special trading agreements with her former colonies on the other. Under preferential trading arrangements, France imports major proportion of her tropical and temperate fruit and vegetable requirements, from these two groups of countries. Besides, French

Overseas Departments (Guadeloupe, Martinique and the Island of Re-union) supply considerable quantities of tropical fruits to this market. As a result, French fresh produce imports from countries outside the EEC members and their Associated territories are insignificant. Viewed against this background, short term prospects for fresh fruits and vegetables exports from India appear to be limited to a few following items.

Mangoes. France is the largest importer of mangoes in the continent, total imports during 1967 having amounted to 172 tonnes. Major suppliers were Guinea (40 tonnes), Mali (30 tonnes), Upper Volta (20 tonnes), Congo (18 tonnes) and India (17 tonnes).

Mangoes are available in the French market round the year though the peak months of import are reported to be April, December and January. Fruits are sold mostly at the speciality shops and the clientele for this item are quite selective. At the retail level, the fruit is sold at FF 8 ($1.60) per piece (weight being 400-425 gms), c.i.f. price being FF 5-6 ($ 1-1.20) per kg. Mangoes arrive by air packed in cardboard boxes. They attract a duty of 9.2% ad valorem in the case of third countries and 1.25% for the Associated territories.

Importers contacted during the Survey indicated that the time is opportune for India to introduce this item in the French market. In a few years, according to them, the Associated territories will be entering the French market with a large volume of mangoes backed by adequate promotional effort. Plans are already afoot to expand the production base in Mali, Guinea, Ivory Coast, Upper Volta and other countries.

Though French consumers like Alphonso and Dussehri, their preference would, however, be for fruits with a smaller stone. Fruits are to be wrapped in tissue paper and protected individually. They should have no blemishes or dents on arrival in the French market. Should India be able to offer acceptable quality of mangoes at a CIF price of $ 1.20 per kg, prospects seem extremely bright.

Lychees. Practically all lychee imports into France are effected by Malagasy and South Africa, average annual imports having been reckoned at 10 tonnes. The main marketing season for lychees in France is between November and January, coinciding with the harvesting season in South Africa and Malagasy. Price at the retail level is estimated at FF 8-10 ($ 1.60-2.00) per kg. Lychees are usually air freighted though, in recent years, Malagasy has been attempting to send them by refrigerated ships at a temperature of 2°c. Average c.i.f. price during January 1968 was FF 5 ($ 1.00) per kg. Lychees are packaged in cardboard cartons, each bunch protected by wood wool or tissue paper.

French importers contacted during the Survey showed their willingness to import Lychees from India at a c.i.f. price of FF 4-5 per kg ($ 0.80 to 1.00), shipment being made by air.

Onions. France imported a total quantum of 81,000 tonnes of onions valued at $ 9.5 million during 1967 as against 66,000 tonnes in 1966. Netherlands, Italy and Tunisia were the principal suppliers. France imports mostly the medium sized white and pink onions with 40/50, 50/60 and 60/70 calibre, preferred varieties being Bianca Aprilatica and Rosa Calabrese. Onions are packed in 25 kg string bags or in fine quality jute sacks, average c.i.f. price being $ 125 per tonne during January 1968.

Importers contacted during the Survey suggested that exports of Indian onions to France could be stepped up considerably from the 1967 level of 2,877 tonnes, provided the quality of the bulb and packaging of the commodity are appreciably improved. They complained that Indian exporters do not provide sufficient allowance for dessication and consequently the net weight of the imported produce is usually 5% to 10% less than the weight shown in the bill of lading. They suggested that onions need to be properly dried before exports. As for packaging, their suggestion was that fine quality gunny bags could be used for protecting the bulbs from damage and discolouration. Average c.i.f. price of Indian onions was only about $ 92 per tonne as compared to $ 127 from other countries.

In this context it is essential to note that India has an export quota of only 1,000 tonnes under the Indo-French Trade agreement. But exports could be effected without restrictions during the off-season period, that is between March 15 and May 1, when onion imports are completely liberalised. French off-season imports of onions, according to trade circles, are estimated at 15,000 tonnes. A duty of 9% ad valorem, however, is imposed on the imports originating from the third countries.

French Beans. Despite a vast local production estimated at 230,000 tonnes per annum, France imports on an average about 14,000 tonnes of fresh French beans during the off-season (that is, November to March) mainly from Italy, Spain, Morocco, Algeria and Senegal. Recently UAR has entered the market as an important supplier in view of the close association of French interests in developing and marketing of Egyptian fresh vegetables.

French consumers, in general, prefer the slim and green coloured Princess variety of beans. Moroccan beans on account of superior quality, are reported to enjoy a premium price in the French market. The off-season import price, according to trade circles, rests around FF 6-7 ($ 1.20 - $ 1.40) per kg. Beans are packed in ventilated cardboard cartons and air-freighted.

Survey findings revealed that India can exploit this potential if beans are properly packed and air freighted at a c.i.f. price FF 5-6 ($ 1.00 to 1.20) per kg. Importers contacted during the Survey have suggested that India can take a sizable share of the off-season French bean market if it could meet the market requirements.

B. Processed Fruits and Vegetables

India's Trade. Exports of Indian processed items to French market have so far been negligible, having risen from 5 tonnes ($ 34,800) in 1965-66 to 7 tonnes ($ 90,133) in 1967-68. Mushrooms (dried) constitute the biggest item, having accounted for 80% of total exports in 1967-68. Among others, mango chutney and mango slices in brine are important. It would, thus, appear that Indian exports form a very inconsequential proportion of the total French requirements for imported products. France has remained an un-explored market in respect of Indian processed items, mainly due to lack of concerted efforts by Indian exporters.

Prospects. Among processed fruits, pineapples, peaches and tropical fruits in syrup like mango and guava offer adequate prospects; imports of pineapples, have been growing rapidly and this upward trend is likely to continue in the future years. The Survey has revealed that given proper export orientation, Indian products including pineapples, mangoes, guavas, pickles and chutneys could find a ready market in France. It would, however, require intensive efforts aimed at educating the French consumers in the use and taste of mango products. Adequate promotion will need to be undertaken at retail points by Indian suppliers in collaboration with the buying organisations who may opt to handle these products.

France is a powerful member of EEC and accords preferential treatment to North African countries under bilateral agreements. While Indian fruits and vegetables are subject to an average duty of 20% ad valorem, similar products from EEC members are exempted from any duty. Furthermore, the Yaounde Convention held in 1964 agreed to grant adequate preferential treatment to the French territories and erstwhile colonies of France which today constitute the biggest suppliers of various fresh tropical fruits and orange juices. The duties leviable on imports from these countries have been reduced to 4%.

It is understood that there being extensive cultivation of mangoes in these countries, processing of mangoes is likely to be undertaken in the immediate future. Being advantageously placed in the matter of tariffs etc. they are likely to offer competition of a very serious nature to the Indian products in the years to come. The situation might worsen if the Yaounde Convention in 1969 decides to grant better preferential treatment to products of these countries. It is accordingly felt that immediate steps should be undertaken for the systematic exploration of the French market for Indian products. The initial reactions to the mango slices as assessed during the Survey were encouraging and a number of importers showed interest in importing mango slices on a trial consignment basis in the initial stages. Discussions indicated the possibilities of entering into regular arrangements with a few canning units in France interested in manufacturing mango nectar on the basis of Indian mango pulp.

With a view to exploiting the prospects available for various items indicated above, the following steps are indicated:

1. Though a quality market, new products are normally sold on the basis of price. It is necessary to quote prices of mango products on a par with the c.i.f. prices of traditional items like peaches and pineapples. The c.i.f. average prices of peaches were around $ 6.00

per carton of 24 x A2½ and Ivory Coast pineapples $ 4.75, during January 1968.

2. With a view to assessing the trade reaction, samples of Indian mango slices were shown to a few importing and wholeselling organisations. The product was found to be acceptable and it was opined that a sufficient demand could be created for it.

3. It is suggested that a limited product test might be undertaken in selected French cities with a view to assessing consumer acceptability of mango products in qualitative and quantitative terms. Based on the results of the product test necessary developmental work should be carried out. Subsequantly, the modified product should be tested in selected outlets. A concerted promotional effort both of general and specific nature would need to be organised with a view to informing the consumers about the availability of mango slices and the special characteristics of the fruit. It would necessarily include the holding of demonstrations in retail outlets and insertion of advertisements in trade and consumer press.

2.2 FEDERAL REPUBLIC OF GERMANY

Background

West Germany represents the largest market for fresh fruits and vegetables in Europe, total imports having averaged 5.08 million tonnes during 1964-66 with a value of $ 6.80 billion. The range and variety of fruits and vegetables imported by West Germany are quite vast, main items being oranges and mandarins, bananas, apples, grapes, pears, potatoes, tomatoes, onions and cucumbers. Major suppliers of these items include Spain, Italy, Israel, Netherlands, France, Hungary, Morocco, Colombia and Honduras.

Average annual imports of processed fruits and vegetables, for which West Germany is the second largest European market, amounted to 585,600 tonnes comprising 252,300 tonnes of processed fruits, 115,800 tonnes of fruit juices and 217,500 tonnes of vegetables during 1964-66. Major suppliers include USA, Ivory Coast, Mexico, South Africa, Israel, Taiwan, Japan, Mainland China, Greece and Bulgaria.

A. Fresh Fruits and Vegetables

Prospects. India's present exports to West Germany are negligible, with the exception of some trial consignments of oranges and mangoes sent during 1966-67. The Survey, however revealed a fairly good outlet for a variety of India's fruits and vegetables, as discussed below:

Mangoes. West German imports of mangoes average about 8 tonnes per annum, India, Kenya, South Africa and Israel being the main suppliers. Import price of mangoes was reported to be about $ 700 per tonne in the West German market during 1968. The retail and wholesale prices of mangoes were around $ 0.90 and $ 0.30 per kg respectively, in Hamburg in January 1968. Duty levied on imports of fresh mangoes is fixed at 11% of the c.i.f. value.

During 1966, India exported one tonne of the alphonso variety of mangoes. Discussions held with the importers indicated that they were satisfied with the quality and packaging of the fruit. According to them, India should be able to sell a good deal more with adequate publicity and promotional support. They further stated that it is the ignorance of the German consumer that is keeping the mango sales at a low level, for one is hardly aware of the nature of the fruit and more importantly the manner in which it is to be consumed.

Exporters from Congo are distributing a leaflet with every mango fruit sold which describes a) the quality characteristics of the fruit, b) how to slice and eat it and c) how to use the fruit in different forms. Distribution of similar leaflets at the point-of-sale coupled with a suitable publicity programme will be the primary pre-requisite in boosting mango exports from India. In the initial stages, mangoes packed in attractive and strong cardboard cartons would have to be air-freighted to the West German market.

Melons. West Germany is a large importer of fresh melons, imports having been of the order of 10,000 tonnes in 1966. Italy is the main supplier, followed by Spain. The varieties preferred in this market are Charentaias, Honey Dew and Ogen. Imports of melons into West Germany are reportedly of an average price of $ 38 c.i.f. per tonne.

India has not exported melons to this market so far. It is however believed that Indian melons would evoke favourable response in this market by virtue of their succulent fibre and sweetness. Discussions with leading importers revealed that they would be willing to import this item from India. They suggested that each melon should be wrapped in tissue paper separately packed in cardboard cartons and protected by wood wool.

Oranges, Mandarins, etc. West German imports of oranges decreased from 762,834 tonnes in 1964 to 722,209 tonnes in 1966. On the other hand, imports of satsumas, mandarins and clementines increased from 89,725 tonnes in 1964 to 99,817 tonnes in 1966. The major sources of imports comprised Israel, South Africa, Spain, Italy, Morocco, Algeria and Turkey.

India has not exported oranges or mandarins to West Germany so far except for a few trial consignments. In oranges, the main varieties preferred in this market are Washington Navel, Valencia Late and Shamouti. As India does not produce these varieties, long term opportunities for capturing a share of the market for oranges in West Germany would depend upon growing these varieties in the country. This of necessity, would be a long term measure.

In the short run, India's chances lie best in making an effort to export Coorg and Nagpur mandarins to West Germany during the off-season, that is between April and October. During this period they would have to compete with mandarins from Morocco and oranges from South Africa and Brazil. The average c.i.f. price of oranges and mandarins imported into West Germany in January 1968 was about $ 260 and $ 250 per tonne respectively. Mandarins for export should be packed in 10 kg cardboard cartons or Bruce boxes. Transportation should be by means of refrigerated ships.

Grapes. West German imports of fresh grapes have ranged between 234,000 tonnes to 258,000 tonnes per annum during 1964 to 1966. Imports of fresh grapes are mainly effected from Italy, Spain, France and other European countries. These imports take place entirely during the harvesting season for grapes in Europe. The off-season market for fresh grapes in West Germany is estimated at 6,000 to 7,000 tonnes, the main suppliers being South Africa and Argentina.

As the Indian harvesting season for grapes coincides with the off-season in Europe, efforts should be made to export choice varieties like Anab-e-Shahi and Gulabi to the West German market during December to May. South Africa is the main supplier to this market during the off-season and the varieties supplied by her are Alphonso Lavelle, Muscat and Rosaki. The prices of South African grapes are reported to average $ 0.25 per kg (export by sea). If India can air-freight grapes during the off-season, price of about $ 0.50 per kg can be expected.

If grapes are ocean freighted (by means of refrigerated ships) Indian prices must be on par with those of South Africa and Spain. For purposes of air freighting, each bunch of grapes should be secured individually, and packaged in cardboard cartons.

Lychees. Data on imports of lychees into West Germany are not available. Discussions with importers of fruits revealed that about 20 to 30 tonnes of lychees are imported into West Germany from South Africa mainly during December-February.

As the harvesting season for lychees in India is between March and May, India should attempt to export this item to West Germany. It may be mentioned here that importers in West Germany compare Indian lychees favourably with those of South African origin. The Survey revealed that a price of $ 8 c.i.f. per 5 kg would be acceptable to the German market. These should be packed in 5 kg cardboard cartons and air freighted.

Chickoos (Sapota). The West German market is not familiar with chickoos. It is however believed that a good market can be developed in West Germany, as leading importers contacted during the Survey evinced interest in introducing this item. A few trial consignments may have to be made, in the initial stages, to gauge consumer reaction for this item. Chickoos have to be packed in 5 kg cardboard cartons for this purpose and air freighted.

Pineapples. West Germany imports 2,000 tonnes of fresh pineapples every year on an average. The main sources of supply are Brazil, Azores, Martinique and

Ivory Coast. The main varieties in demand were reported to be Queen and Gayene Lisse.

India had sent a few trial consignments of pineapples to West Germany in 1965. All importers among whom they were distributed, were of the opinion that Indian pineapples compare well with those of Kenya, and that they would be acceptable to the market. They suggested that India should supply smaller sized fruits weighing not more than 1.5 kg packed securely in cardboard cartons. November to May is reported to the best period for pineapple sales in West Germany. Average c.i.f. price during January 1968 was around $ 0.65 per kg.

Papaya. Discussions with leading importers of fruits revealed that papaya is at present being imported from South Africa, Spain and USA. The acceptable varieties were reported to be Honey Dew and Washington, preference being mainly for fruits of smaller size. The import price on an average is about $ 1,000 per tonne.

The Survey findings reveal that Indian papayas would be able to find a good market in West Germany especially during winter months. For export purposes, Indian papayas should be individually wrapped in tissue paper and then each fruit has to be placed in a separate compartment of a card board carton. Wood wool padding should also be provided. Papayas should be air freighted.

Limes. Imports of lemons and limes into West Germany ranged between 136,000 tonnes to 140,000 tonnes per annum during 1964-66 period. Lemons account for a predominent share of these imports. The principal supplying countries to this market were Italy, Spain, Turkey and South Africa.

As India does not produce lemons, attempts should be made to introduce limes as a substitute for lemons in this market. The quality of Indian limes was reported to be acceptable to German importers of fruits. It is suggested that 5 limes should be placed in string bags or polythene bags, which in turn should be packaged in cardboard cartons.

It is suggested that trial consignments should be sent to importers at Frankfurt and Hamburg for assessing the market reactions to Indian limes. The acceptable c.i.f. price would be $ 0.12 per bag of 5 limes.

Strawberries. In 1966, West German imports of strawberries were of the order of 30,525 tonnes, Italy, Netherlands and Belgium-Luxemburg being the main suppliers.

Strawberry imports into West Germany take place mainly during the European harvesting season, that is during April-September. Greece, Spain, South Africa and USA supply to the extent of about 5,000 tonnes per annum during the off-season. Off-season supplies fetch a c.i.f. price of about $ 0.65 to $ 0.75 per kg which is almost double the seasonal prices.

Considering that strawberry cultivation in India can be extended to plains, and that the harvesting season (in the plains) will be between February and April, India's opportunity for entering the German market as an off-season supplier appears to be fairly bright. Importers contacted during the Survey suggested that India's efforts should be directed towards cultivating and supplying the Israeli varieties like Larsen and Early Dawn which are becoming increasingly popular in the German market. As for packaging, it is necessary to pack ½ kg fruits in a plastic tray covered with a polythene wrapper. 6 to 8 such trays should be kept in a cardboard carton and air freighted.

Aubergines. West German import statistics classify aubergines along with other leguminous vegetables. The Survey, however, indicated that the market size of aubergines is about 1,000 tonnes per annum. Imports mainly come from Israel, Bulgaria, Italy and Ethiopia.

Discussions with the importers revealed that the preference in this market is for the 'long dark' and 'round violet' types of aubergines. The average c.i.f. price of imports during March 1968 was about $ 0.70 to $ 0.75 per kg. Some traders evinced interest to import this item from India round the year. Cardboard cartons should be used for packing aubergines.

Capsicums. Imports of fresh capsicum into West Germany were of the order of 43,390 tonnes in 1966. Netherlands was the main supplier of capsicums to this market and accounted for a share of nearly 50% of the total imports. The other suppliers in order of importance were Hungary, Yugoslavia, Ethiopia, Romania, Bulgaria, Israel and USA.

A major proportion of imports takes place between April to mid-November, which is the harvesting season for capsicums in Europe. Off-season imports are supplied by Israel and Ethiopia. During the season, import prices range from $ 0.60 to $ 0.80 c.i.f. per kg whereas off-season import prices vary between $ 0.70 to $ 0.85 c.i.f.

per kg. Israeli capsicums, being very good in quality, fetch a price upto $ 0.90 c.i.f. per kg. The market preference is mainly for capsicums of dark colour, most popular variety being Californian Wonder.

India does not export capsicums to this market at present though they are available in India round the year. Importers contacted during the Survey indicated their willingness to import this item from India. Late November to mid-March seems to be the best season for exporting this item as that period represents the European off-season. Capsicums should be packed in 5 kg cardboard cartons and air-freighted.

French Beans. Imports of French Beans into West Germany were 21,545 tonnes, 18,237 tonnes and 15,845 tonnes in 1964, 1965 and 1966 respectively. Major proportion of the French beans imports take place during March to October season, when the European production is at its peak in Italy, Belgium-Luxemburg, Netherlands and Hungary. Off-season imports estimated to be of 1,000 tonnes per annum mainly come from UAR. Preference in the German market is reported to be mainly for the Moroccan type of beans known as Princess, which is slim looking, and of light green colour. These beans retain their colour even after cooking. The average c.i.f. price during the season was reported to be around $ 0.20 per kg and in the off-season, $ 0.40 to $ 0.55 per kg. If India could supply the Princess variety French beans between November and April, they could fetch a sizable share of the German off-season market. Beans should be packed in ventilated cardboard cartons and air-freighted.

Onions. West German imports of onions increased from 184,000 tonnes in 1964 to 203,000 tonnes in 1966. Imports accounted for over 90% of total supplies of onions in the market, indigenous production being very small at 15,000 to 20,000 tonnes per annum. Onions are imported into West Germany from Netherlands, UAR, Poland, Italy, Hungary, Spain and Czechoslovakia.

While the European markets supply onions to West Germany between March and October, UAR's supplies are available in this market mainly during November to February which can be considered the off-season. The preference in this market is mainly for medium sized white onions of the Spanish variety. Onions meant for this market should be mild in taste. The average c.i.f. price during the season is around $ 80 to $ 90 per tonne, off-season prices being 10% higher than seasonal prices. Provided India could supply the required white onions, it would be possible to export about 4,000 to 5,000 tonnes of this item to the German market. Onions should be packed in 25 kg string bags and ocean freighted.

B. Processed Fruits and Vegetables

India's Trade. Exports of processed fruits and vegetables from India to West Germany during the last two years have been negligible, total exports having amounted to 67 tonnes valued at $ 30,666. Major items exported from India to West Germany are shown below:

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India's Major Exports of Processed Fruits & Vegetables to West Germany 1/

Quantity: Quintals
Value : Thousand Rupees

	1965-66		1966-67	
	Quantity	Value	Quantity	Value
Mango jam	1	Neg	6	2
Mango juices	30	6	2	1
Other fruits in temporary preservative	-	-	5	3
Fruits preserved in syrup	83	18	151	45
Mango pickles and chutney with sugar	280	71	445	144
Mango pickles and chutney without sugar	8	2	28	11
Other pickles and chutney	33	9	13	6
Vegetables in air tight containers	-	-	3	1

It would be seen from the above that mango pickles and Chutneys with added sugar constituted the major item exported from India to West Germany, exports having risen from 28 tonnes in 1965-66 to 45 tonnes in 1966-67. Other important items include mango and guava slices, pickles and chutneys, jams and juices.

Prospects. The Survey revealed that West Germany continues to be one of the largest West European markets for processed items including canned fruits and vegetables. Despite considerable domestic production, West Germany relies upon

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1/ DGCI&S, Calcutta

overseas supplies for a number of items including asparagus, peas, mushrooms, mixed vegetables and semi-processed vegetables as well as various fruit preparations like juices, peaches, pineapples, mandarin orange segments and grapefruit sections. Discussions held with the trade indicated that West Germany might offer adequate prospects for the sale of mango pulp, mango slices and juices, lychee wholes, pickles and chutneys, pineapple slices, juice concentrates and mandarin orange segments.

While exports of mandarin orange segments, juices and juice concentrates will depend upon India's capability of producing the right product at competitive prices, others indicated in the foregoing paragraph offer prospects in the immediate future. The Survey revealed that Indian products are still unknown in the German market, not having been able to establish themselves in West Germany. Indications suggest a rising trend in respect of consumption of mango pickles and chutneys and tropical fruits preserved in syrup. It was mentioned by the trade that scope exists for expanding sales of these items provided Indian manufacturers and exporters are in a position to enter into agreements with large buying groups in West Germany. With consumer incomes rising at a very fast rate, the demand for newer and exotic canned fruits and vegetables is likely to expand considerably in the future years. German consumers like variety and are always eager to experiment with new products. Price, however, constitutes an important factor in the sale of a new product as the consumers are likely to compare their prices with those of popular items like peaches, pineapples and pears. Following are some of the ruling prices of major items sold during February 1968:

Prices of Selected Products in West Germany

		Pack Size	Distributor's Price per dozen $
Pineapples			
Philippines	Del Monte sliced pineapple 'Fancy'	24x20 oz	2.50
Hawaii	Hawaiin Belle sliced pineapples 'Choice'	"	2.52
Taiwan	Taisuco Sliced pineapples	"	1.80
Ivory Coast	Afrikan Pride sliced pineapples	"	1.75
Peaches			
South Africa	Light Yellow Cling	24x2½ oz	2.80
Australia	Peach slices	"	2.50
Fruit Cocktails			
Argentina	Idelrio Light Syrup	"	3.90
South Africa	Cling Glory 'Choice Light'	"	3.70
Australia	Light Standard	24x15 oz	2.30

With a view to exploring the prospects available in the West German market, following steps need to be initiated:

1) Discussions with leading processors indicated that mango nectar would prove to be a very good seller in the West German market. Mango juice has been going in small quantities in the recent past. A number of manufacturers showed interest in entering into regular

arrangements with Indian counter-parts for the supply of mango pulp for making mango nectar in West Germany under local brands. It is estimated by the trade that more than 25,000 cases of mango nectar could be annually sold in West German market initially, thereby indicating the scope of adequate exports of mango pulp from India.

2) West German manufacturers have assisted in the development of fruit and vegetable canning industry in Kenya and Ethiopia by extending development loans and supplying equipment and technical know-how. In the processing plant financed by the German industry, the share held by Kenya was 51% as against 49% of the West German Pool. According to the arrangement, exports of processed items are directed through a Marketing Board in Kenya for ensuring uniformity in production, packaging and pricing.

Discussions with the leading manufacturers in West Germany signified their interest in collaborating in the development of Indian canned fruit and vegetable industry particularly in the fields of pineapples and tropical vegetables provided attractive terms were offered by the Government of India.

3) Corporate chains and whole-sale buying groups are the pivotal organisations for food merchandising in West Germany. In view of the wide coverage they can ensure to the product, it is considered a useful strategy to contact some of these buying groups particularly, for the introduction of new products like mango slices, guava slices, mango juices, etc. It was opined by the trade that though some quantities of mango slices have been coming to the

West German market, mango continues to be a relatively unknown fruit. German consumers in general are not aware of the various uses to which mango slices can be put. It would, therefore, be essential to earmark adequate funds for the promotion of tropical fruits in West German market. Demonstrations in selected super markets and self-service stores backed by attractive point-of-sale materials should be organised for disseminating information to consumers. Distribution of recipe books on the lines prepared by Australia and Israel would go a long way in establishing the Indian products among the German consumers. It has been estimated by the trade that Australian and Israeli manufacturers spent about $ 135,000 and $ 50,000 respectively for promotion and publicity in West Germany in 1966. It was learnt that one of the Indian manufacturers of fruit juices had recently utilised the medium of TV for popularising Indian products with success. Funds available at his disposal were, however, inadequate for the purpose of undertaking a comprehensive promotional campaign in West Germany.

4) Mango pickles and chutneys which are selling in small quantities in West Germany, show adequate growth potential. Presently mango pickles and chutneys packed in UK are selling in large quantities in West Germany. Those coming from India in retail packs are also marketed by some of the speciality shops, but they suffer from presentational and packaging disadvantages. The bottles used by Indian packers are normally hand-blown and are therefore relatively heavy causing higher freight rates. Besides, the hand blown bottles do not look as attractive as automatically manufactured bottles. Labels are also reported to be old fashioned and unsophisticated. In view of the adequate possibilities existing for the

sale of pickles and chutneys, it might be worth-while to contact local processors in West Germany for packing Indian pickles and chutneys in superior bottles for sale under their own brand names. This aspect needs serious consideration by the Indian manufacturers of pickles and chutneys.

5) It was suggested that for increasing the sale of items like mango slices, it might be useful to undertake product testing and test marketing in Berlin and Frankfurt which are the pace-setters for eating habits in Germany. Based on the results of these efforts, the product could be modified to meet consumer requirements in terms of quality, acidity, consistency, presentation and packaging.

6) West Germany also offers adequate market for certain canned vegetables like aubergines, bamboo shoots, peas, etc. Bulgaria reportedly exports large quantities of canned aubergines to West Germany. Asparagus is probably the largest item among canned vegetables currently imported into the West German market. Efforts need to be made for increasing the availability of fresh asparagus for canning purposes in view of the prospects that exist in West Germany and other European countries. Asparagus could become one of the top foreign exchange earners for India in the long term provided adequate steps are taken to bring more area under cultivation and improve canning techniques in India. It may be indicated that there are approximately six units in Jammu & Kashmir which are presently canning asparagus in large, medium and small sizes. Their products appear to be acceptable and if prices are competitive, Europe may as well offer good prospects in the medium term itself. Likewise efforts for initiating production of tomato concentrates and mandarin orange segments require to be made, as they constitute growing items in the market.

2.3 ITALY

Background

Despite sizable production base that exists for horticultural produce, Italy is an important consuming market for selected fresh fruits and vegetables. With the rapid rise taking place in per capita income and its consequent effects on the living standards, the demand for fruits and vegetables, not being produced in the country is likely to rise manifold in the coming years. Trade predicts that Italy is going to be the most import potential market in the Mediterranean region for increased sale of tropical fruits and vegetables. Total imports of fresh fruits and vegetables averaged 530,000 tonnes during 1964-66 comprising 320,000 tonnes of vegetables and 210,000 tonnes of fresh fruits, seed potatoes, bananas, grapefruits and pineapples being the major commodities. While bananas are mainly supplied by Somalia, Ecuador and Ivory Coast, seed potatoes come from Netherlands, West Germany, Canada, Poland and Denmark.

Considerable quantities of processed fruits and vegetables are also imported into Italy, averaging 23,900 tonnes during 1964-66 period. Canned pineapples, jams and jellies constitute the most important items currently imported into the country, USA, Taiwan, France and Morocco, being the major suppliers.

A. Fresh Fruits and Vegetables

Prospects. India's exports of fresh fruits and vegetables to Italian market have been negligible, with the exception of a few consignments of bananas having been despatched in 1966.

Though short-term prospects for Indian items are limited, Italy could be developed into a very important outlet for bananas and mangoes. Prospects existing for these two items are discussed below:

Bananas. Discussions held with Italian importers indicated their willingness to import bananas from India provided they were of the right varieties and offered at prices akin to those emanating from Somalia and Ecuador. Presently Italian imports include varieties like Valery and Lacatan and small quantities of Dwarf Cavendish. It should be possible for India to capture a share of the Dwarf Cavendish market in Italy in the short run. The long term prospects for Indian bananas would mainly depend upon the growth of varieties like Lacatan and Valery.

Mangoes. The Survey revealed that mangoes could become an important item in Italy provided efforts aimed at popularising this fruit are made in a systematic manner. Mangoes are presently imported to the extent of about 10 tonnes a year from South Africa but the Survey revealed that the export volume could grow manifold in the future years. Price of the mangoes imported from South Africa is presently around $ 1.50 per kg c.i.f. Mangoes are required to be of a good variety like Alphonso and Dussehri, packed in a 5 kg carton containing 20 to 22 fruits.

Other Items. It was indicated that prospects exist for the sale of other tropical fruits like lychees and guavas, a few importers having shown interest in securing supplies on an experimental basis.

B. Processed Fruits and Vegetables

India's Trade. Exports of Indian canned fruits and vegetables to Italy have so far been negligible as would be indicated from the table below[1]:

	1965-66		1967-68	
	Quantity (Tonnes)	Value (Rs '000)	Quntity (Tonnes)	Value (Rs '000)
Preserved fruits	-	-	-	-
Mango Juice	-	-	0.3	0.7
Mango pickles and chutneys with sugar	1.2	4.0	3.3	24.7
Pickles and chutneys, others	0.3	1.0	0.1	0.4

Total exports of processed fruits and vegetables including chutneys were around 3.7 tonnes in 1967-68 as against 1.5 tonnes in 1965-66. Italian market has practically remained unexplored in respect of Indian canned fruit and vegetable items. Scope, however, exists for the sale of tropical canned fruits like mango, guava, lychees and mango pickles and chutneys.

Prospects. In view of the considerable production at home and limited domestic consumption of processed fruits and vegetables, Italy offers little scope for the sale of canned fruits and vegetables with the exception of processed pineapples and tropical canned fruit items like mango and guava products. Trade discussions indicated that with proper planning and adequate promotional effort, it might be possible to sell limited quantities of these items through supermarkets. Mainland China for instance has been successful in selling some of the exotic vegetables like bamboo shoots, water chestnuts and chilli products during the recent years.

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[1] DGCI&S, Calcutta

Exports of preserved fruits amounting to 400 kg in 1966-67 represent the imports effected by FAO Head Ouarters for sale in their retail shop, for catering to the staff requirements. Discussions with the authorities responsible for these purchases indicated that they are not satisfied with the quality of the mango slices being supplied to them.

Following suggestions are made with a view to exploring the Italian market for Indian products.

1. Market potential exists for tropical canned products like mango slices, guava slices and lychee wholes as well as mango and guava juices. These products are still unknown in the market with the exception of small imports coming from Venezuela and India. A phased introduction of these items is called for, supported by adequate promotional effort. Trial consignments will need to be despatched for eliciting trade reactions. Subsequently, it would be necessary to give limited promotional support to those desirous of importing these items.
2. In general, a large proportion of Italian families do not use canned fruits and vegetables, partly because of the abundant availability of fresh produce, and also because of high prices. Against this background, it would be necessary to quote competitive prices for the Indian tropical products.

3. Discussions during the Survey indicated that scope exists for the sale of grapefruit juice and blended grapefruit and pineapple juice. The State Trading Corporation may initially explore the possibility of exports of these items.

4. With the introduction of exotic vegetables like water chestnuts and bamboo-shoots by China, a growing trend is discernible towards the consumption of tropical vegetables. Though concrete reactions to the taste, quality and colour of Indian vegetables could not be ascertained during the Survey, a large number of importers signified interest in receiving samples of these vegetables.

5. There appears to be a limited market for tropical juices like mango, guava, lime and banana. However, the introduction of these items would need adequate promotional effort aimed at educating the people about the total range of Indian tropical fruit preparations. It has been indicated earlier that promotion and publicity is very vital for increasing sales in Italian market.

   For instance, the scale of advertising expenditure incurred by some of the leading Italian canning companies in 1965 is indicated below[2]:

(Thousand Dollars)

	Cirio	Arrigoni	De Rica	Star	Althea	Rebaudengo
Canned Tomatoes	108.2	99	123.5	300	18.7	-
Tomato concentrate	-	-	7.2	373	97.0	-
Vegetables	137.3	87.6	195.1	58	-	-
Fruit	17.9	-	41.0	-	-	-
Ready-prepared sauces	125.6	-	-	675	198.5	333.3
Jams	131.4	6.3	-	-	41.8	-
Collective	125.1	7.9	46.6	77	-	-
	645.5	200.8	413.4	1483	346.0	333.3

2/ Field Survey

6. Indications are available that some of the Italian canning units might be interested in processing and packing items like guava and mango juice, mango nectar and mango pickles and chutneys based on the import of these items from India in bulk.

2.4 NETHERLANDS

Background

Over 35% of the total consumption of 1.64 million tonnes of fresh fruits and vegetables during 1964-66 was met through imports. Total imports averaged 561,000 tonnes comprising 386,000 tonnes of fruits and 175,000 tonnes of vegetables. Principal products imported presently include oranges, bananas, grapes, grapefruits, lemons, apples, potatoes and onions. Whereas citrus fruits are mainly supplied by Spain, Morocco, Israel and USA, bananas come from Colombia and Ecuador, grape market being dominated by South Africa and Italy.

Imports of processed fruits and vegetables averaged 120,000 tonnes during 1964-66, total value being $ 69.10 million. Principal items entering Dutch market include pineapples, peaches, fruit cocktails, strawberries, apricots, citrus juices among fruits, and beans and dehydrated onions among vegetables.

A. Fresh Fruits and Vegetables

Prospects. India's present exports of fresh produce to Netherlands are negligible, a small quantity of onions having been sent during 1966. Export opportunities for India in the Dutch market are limited to a few tropical specialities like mangoes and lychees in the short-term. The other items which could find increasing market in this country during off-season are oranges and onions. Prospects of these various items are discussed below:

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i) Mangoes. Except for despatching a trial consignment during 1965-66, no systematic efforts have been made by India to export mangoes to Netherlands. At present mangoes are imported on a limited scale into Netherlands from Congo via Brussels. Importers contacted during the Survey indicated their willingness to introduce superior varieties of mangoes into the Dutch market provided the fruits are graded on the basis of 4 to 6 fruits per kg of uniform size. Twelve such fruits are to be packed in strong cardboard cartons, and air-freighted at a price of $ 0.60 per kg c.i.f.

ii) Lychees. The extent of lychee imports into Netherlands is not separately shown in the trade statistics. Limited quantities, however, are reported to be arriving from South Africa during December-February season. If lychees could be air-freighted at c.i.f. price of $ 2.20 per kg, India can hope to develop a limited market for this item in Netherlands.

iii) Oranges. Of the 213,000 tonnes of oranges, clementines and mandarins imported into Netherlands during 1967, nearly 50% were received during April-October. Brazil (24,09 tonnes), Spain (22,377 tonnes), USA (23,064 tonnes) and Morocco (4,092 tonnes) supplied the major share of Dutch off-season requirements.

Coorg mandarins, Indian Mosambis and Maltas could be introduced into Dutch market during the off-season period. Discussions held with the leading importers indicated that these items might find favour with Dutch consumers in view of their strong acidic tastes. Attempts therefore have to be made to despatch a few trial consignment for ascertaining consumer reaction for these items.

Large scale operations in citrus would however be a long term prospect, when India is in a position to grow and supply acceptable quality of varieties like Shamoutis, Valencia Lates and Washington Navels.

iv) Onions. Though Netherlands is one of the biggest producers (195,000 tonnes per annum) and exporters (164,000 tonnes) of onions, during the off-season months, that is April to July, she imports about 20,000 tonnes of onions per annum, mostly from the United Arab Republic. Dutch consumers prefer the medium-sized white onions of the Spanish variety. If India could supply this variety, it can establish a regular off-season market for onions in Netherlands. During 1968, Egyptian onions were quoted at a c.i.f. rate of $ 1.10 per bag of 25 kg.

B. Processed Fruits and Vegetables

India's Trade. India's exports of processed fruits and vegetables mainly comprising pickles and chutneys and small quantities of mango slices rose from 23 tonnes in 1965-66 to 30 tonnes in 1966-67. Indian stakes in the Dutch market having been insignificant, Indian processed items like mango slices and pickles and chutneys remain relatively unknown in the Dutch market.

Prospects. Total imports of fruit preparations including canned fruits, jams and jellies and juices had risen from 33,000 tonnes in 1965 to 42,000 tonnes in 1967. Major items among canned fruits include pineapples, peaches, fruit cocktails, orange juice and apricots. Total imports of juices amounted to 14,937 tonnes in 1965 comprising 5,918 tonnes of citrus juice, 1,214 tonnes of grape juice and 6,905 tonnes of other fruit juices; imports of citrus juices rose from 5,918 tonnes in 1965 to 12,737 tonnes in 1967. Major suppliers of canned fruits include USA, Australia, Greece and Taiwan, and citrus juices are mainly imported from Spain, USA, Brazil and Italy.

While Netherlands offers only limited prospects for canned vegetables, there is a general buoyancy in the canned fruit market, the domestic industry being not able to meet the entire requirements of the country for canned fruits. It was also revealed in the Survey that the apparent consumption of canned tropical fruits has been registering a rise, from 0.90 kg in 1960 to 1.55 kg in 1964 and about 2 kg in 1967. It was evident that a growing appreciation of the tropical processed items is discernible in the country. A number of business houses handling canned fruits and vegetables showed keen interest in importing products from India including pineapple slices, pickles and chutneys, mandarin orange segments, citrus juices and processed beans. While the sale of Indian citrus juices and mandarin orange segments in the Dutch market will essentially be a long-term proposition, the market offers immediate prospects in respect of pineapple slices, pickles and chutneys and beans. Tanzania, for instance, has been able to make an effective entry into this market in the recent past mainly at the expense of traditional suppliers of beans like USA.

Netherlands is a price market for most of these low price products. Pineapple is sold in the market mostly on price considerations. It has also been indicated that

East European countries have been able to successfully enter the canned vegetables market of Netherlands on the basis of lower price quotations.

Discussions held with an importer of Indian mango chutney in bulk form indicated that the colour of the chutney exported presently by India is too dark for the Dutch consumers. This firm is mostly packing chutneys in retail packs for sale under its own label. Possibilities exist for expanding exports of mango chutney provided the Indian manufacturers are able to improve the quality of the chutney as well as its packaging. The present market size for pickles and chutneys has been estimated at 200 tonnes. India can certainly expand its exports of pickles and chutneys to Netherlands provided manufacturers are prepared to meet the requirements of the market in terms of quality, price and presentation.

For exploring these prospects, following suggestions need to be bornein mind:

1. The market for canned fruits and vegetables is fiercely competitive and international brands like Libby's and Del Monte have been selling well in the Dutch market. Besides, East European countries, have captured the market most successfully purely on the basis of low price quotations. The products, besides meeting the sophisticated quality standards of the market, have to be competitively priced. The following price indication would be useful as a guideline for exporting Indian pineapples to the Dutch market:

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Prices of Pineapples Products in Netherlands

Country	Product	Pack	Price (CIF) ($)
Taiwan	Pineapple Juices	24x2½	4.04
	Choice Slices	"	4.95
	Tidbits	"	4.23
South Africa	Choice Slices	"	4.00

2. The Dutch market, as mentioned above, is oriented towards larger and fewer stores resulting in the concentration of buying power among a few chain stores. This situation has resulted in making the chain stores more powerful as they are in a position to offer wide coverage, though their outlets are scattered all over the country. Promotion and publicity thus has come to play a very important role in the sale of canned fruits and vegetables. Libby's, Del Monte and Australian canners have been spending large amounts of money on promotion campaigns including special price reductions, promotion weeks and demonstrations at the point-of-sale. The voluntary chains will be interested in promoting mango slices in Dutch market provided suppliers are prepared to allocate promotional budgets in the initial stages. It has been estimated that a minimum expenditure of $ 5,000 will need to be incurred for undertaking this type of promotion. A very big department store in Amsterdam has been promoting Indian products mainly handicrafts and textiles through special Indian Weeks. They showed keen interest in selling Indian canned fruits and vegetables including juices during such promotion weeks. This is an opportunity which needs to be exploited fully by Indian manufacturers.

3. It has been mentioned elsewhere in the Report that small quantities of Indian mango pickles and chutneys have been finding their way into the Dutch market. A taste for Indian chutneys has been gradually developing among Dutch consumers though the quality does not come up to the standards of the sophisticated Dutch consumers. It was indicated that the colour of mango chutney is too dark for the Dutch consumers. Additionally the packages in which small quantities of pickles and chutneys have been going to Netherlands are too old fashioned and the bottles are not found to be of acceptable quality, mainly becaus they are hand-blown. Labels were also not found satisfactory. Efforts need to be made in the direction of improving the presentational aspects of Indian packaged fruits.

4. In the beginning, special campaigns need to be promoted by Indian manufacturers for introducing tropical fruits like mango and guava in slices. Small quantities of these items may have to be sent to the interested parties for distribution among selected outlets. The Indian products which were shown to a few importers, were found to be acceptable. It was also opined that mango slices should not sell at a price higher than pineapples.

2.5 BELGIUM-LUXEMBURG

Background

Besides having a strong hold in the European markets as a purveyor of certain specialised items like chicoree witlof, hot house grapes and tomatoes, Brussles sprouts, carrots, turnips and salad type vegetables, Belgium is a significant importer of fresh fruits and vegetables. Total imports averaged 809,000 tonnes during 1965-67, comprising 395,000 tonnes of fruits and 414,000 tonnes of vegetables, oranges, potatoes, bananas, apples, onions and peaches being the principal items.

Consumption of processed fruits and vegetables in Belgium-Luxemburg has been upward, having risen from 125,000 tonnes in 1965 to 141,000 tonnes in 1966. Despite considerable production of processed fruits and vegetables in the country, Belgium's imports have been substantial at 91,500 tonnes consisting of 48,500 tonnes of processed fruits and 43,000 tonnes of vegetables over 1965-66, total value being $ 31.80 million. Major items of imports include pineapples, peaches, jams & jellies, apricots, pears and mixed fruits, grape and orange juices among fruit preparations and tomato wholes, peas, mushrooms and french beans among vegetables.

A. Fresh Fruits and Vegetables

Prospects. Except for despatching a few trial consignments of mangoes in 1965-66, India has not so far made any efforts to tap the market potential that exists in Belgium-Luxemburg for fresh commodities. Survey findings reveal that concentrating upon the export of a few selected products like mangoes, lychees, strawberries, onions and french beans in the initial stages can help India to build up a sizable trade in this market. The long term prospects, however, lie in the export of bananas, mandarins and oranges, grapefruits and lemons. Items which offer considerable scope are discussed below:

Bananas. Bananas rank second in the import trade of horticultural produce in Belgium-Luxemburg, imports having risen from 79,600 tonnes in 1965 to 93,100 tonnes in 1967. Bananas are mostly imported from Ecuador and Colombia. There are no quantitative restrictions on the imports of bananas into Belgium though former Belgian territories and Surinam enjoy 'nil' tariffs while the ECM associated territories face 6% duty and bananas emanating from third countries attract a duty of 18%.

Considering that Belgium's intake of bananas will reach an estimated level of 100,000 tonnes per annum by 1970 and imports from Congo having been virtually stopped, it should be possible for new entrants like India to gain a foothold in this market. Though the present trend is towards varieties like Valery and Lacatan, considerable quantities of Dwarf Cavendish imported from Canary Islands are consumed in the market. Supplies from Congo, major exporter of bananas to the Belgian market till a few years back, comprised mainly Dwarf Cavendish varieties. India which has a substantial production of Dwarf Cavendish varieties can profitably explore this market. It would, however, be necessary to aim at exploring market for Indian bananas on a regional basis and in this context Belgium should be viewed as an important buyer. While it is possible to build up a small trade in Dwarf Cavendish variety in the immediate future, long-term prospects would naturally depend upon India's ability to produce varieties like Lacatan and Valery which are in greater demand in European countries.

Citrus Fruits. Oranges claiming the largest share in the Belgian imports of fresh fruits, were imported to the extent of 145,000 tonnes in 1967 as against 140,700 tonnes in 1965. Spain, followed by Israel, Italy and South Africa, is the largest supplier.

Import prices of citrus fruit vary widely in the Belgian market depending upon the country of origin. During January 1968 following prices were quoted in the Antwerp auction markets:

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Import Prices of Citrus Fruits in Belgium

(cif Antwerp, January, 1968)

	BF/100 kg	
Spanish oranges	834	($ 16.7)
Spanish mandarins & clementines	1,275	($ 25.5)
USA oranges	2,378	($ 47.5)
Israeli Shamoutis	978	($ 19.6)
Lemons from USA, Italy and Netherlands	850	($ 17.0)

Following the EEC common external tariffs which came into force on January 1, 1967, Belgium imposes a duty of 15% on imports effected during April 1 to October 15 and 20% for the rest of the year. The same rates apply for the imports of mandarins and clementines. Duty on lemons is fixed at 8% and on grapefruits 7.2%.

Preferred citrus fruit varieties in the Belgian market are Washington Navel, Valencia Late and Shamouti in oranges, Marsh Seedless in grapefruits and the thick skinned Sicillian variety in lemons. While oranges are usually packed in cartons or bruce boxes, lemons are packed only in cardboard boxes.

India does not produce, at present, any of the citrus fruit varieties, indicated above, on a commercial scale. She has, however, a large production of maltas, Mosambis and limes, whose export prospects are yet to be confirmed. Importers contacted during the Survey indicated their willingness to introduce the Indian varieties. According to them, consumer preference could be developed for these items in view of their slightly pronounced acidic tastes. A few trial consignments of limes, Mosambis and maltas may therefore be sent and the Belgian consumer reactions ascertained before launching upon regular exports. Maltas and Mosambis have to be packed in cartons and bruce boxes of 20 kg and limes in cardboard boxes of 10 to 12 kg.

Mangoes. Though mangoes are not listed separately in the official import statistics of Belgium, the Survey findings reveal that approximately 100 kg of mangoes are imported per week. The main sources of supply are UAR, Israel, South Africa, Malawi and Congo. Import prices varied between BF 40 and BF 50 per kg during 1967. Mangoes are imported into Belgium almost round the year from these sources. Import duties are levied at the rate of 17.2% for the third countries and 6.2% for ECM Associates. Mangoes are packed in cardboard cartons, each containing 12 to 14 fruits.

The retail price of mangoes in the Belgian market is reported to be around BF 160 ($ 3.2) per kg. Owing to the high price, mango has so far remained an exclusive fruit in Belgium, which is also apparent from the small quantities imported. Belgians, in fact, are yet to acquire a taste for mangoes and hence the 2,000 kg of Indian mangoes exported by the State Trading Corporation on a commission basis in 1966 could not be disposed of entirely.

It has been estimated that good quality mangoes, air-freighted from India, could be retailed at a price of BF 150 ($ 3) per kg. In view of the higher price and the limited clientele, it is suggested that efforts to export mangoes should be attempted, in the initial stages, on a modest scale. Large exports would materialise only through persistent efforts directed at popularising the fruit in the Belgian market.

Lychees. No data on import of lychees into Belgium are available. Survey findings reveal that currently lychees are being imported from South Africa and Malagasy in small quantities. It was also learnt that Indian lychees, when air-freighted, would be acceptable at a price of BF 40-50 ($ 0.80 to 1.0) per kg. In order to obtain a sizable share of the market for lychees in Belgium, it would be necessary to create facilities for handling, grading, packing and air transportation in consonance with the methods adopted by Malagasy and South Africa. South Africa, for instance, has recently started exporting lychees in refrigerated ships at a temporature of $2^{o}c$. India, however, would have to air-freight lychees packed in cardboard cartons of 4 kg and the fruit protected by wood-wool or tissue paper.

Onions. Belgium imports onions mainly from Netherlands and UAR. During 1966-67 imports were of the order of 12,857 tonnes valued at BF 73 million ($ 14.6 million). Preferred variety in this market is Bianca aprilatica, a yellow skinned, medium sized white onion. Average cif price per tonne during January 1968 was BF 4,750 ($ 95). Onions are packed in 25 kg string bags.

Importers contacted during the Survey evinced interest to import onions from India during December-February, the off-season for major supplying countries like UAR, Poland, Italy and Netherlands. For third country imports, a duty of 7.2% is levied while EEC Member countries have free access to this market.

Other Vegetables. Belgium annually imports on an average about 160,000 tonnes of fresh vegetables, mainly from its EEC partners. Principal items of import are cauliflowers, carrots, turnips, mushrooms, peas and tomatoes. Italy, France and Netherlands are the major suppliers.

Among the fresh vegetables, only green capsicums and aubergines offer some scope for exports from India. Belgian imports of these items during 1967 were of the order of 1635 tonnes and 400 tonnes, respectively. Present suppliers include France, Italy, Bulgaria and Ethiopia. India should be able to tap this potential under a suitable package programme of air-freighting assorted vegetables to the European markets on a regular basis.

B. Processed Fruits and Vegetables

India's Trade. Exports of processed fruits and vegetables from India have been very negligible, having fallen from 11 tonnes in 1965-66 to 6 tonnes in 1966-67. Major products include preserved fruits, mainly mango slices and mango pickles & chutneys. Indian processed fruits and vegetables are thus still unknown in the growing Belgian market.

Prospects. Imports of processed fruits have been showing a steady improvement during the past three years, imports having risen from 36,000 tonnes to 40,000 tonnes during 1965-67 period. Major items include pineapples, peaches, jams, apricots, strawberries and processed fruits in bulk containers. While pineapples and peaches are imported mainly from USA and Taiwan, apricots come from Spain and South Africa. The Survey revealed that Belgian market offers adequate prospects for the sale of Indian pineapple slices, mango slices, mango juices and tomato, guava, grapefruit, lime and orange juices. The exploitation of these prospects will, however, depend upon certain pre-requisites which are discussed below along with necessary marketing information:

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1. Pineapples which constitute the biggest item among imported products could be sold in adequate quantities in Belgium, provided the prices and the quality are acceptable. Price has come to be a very important factor particularly after the entry of countries like Ivory Coast in the pineapple market purely on the basis of lower price quotations. Prices of pineapples emanating from Taiwan are also lower than those of USA. Samples of Indian canned pineapples shown during the Survey were found to be of acceptable standards in respect of quality, colour and taste. If Indian manufacturers are in a position to offer pineapples at the cif rate of $ 5.50 for 24x2½ size, considerable quantities of pineapples could be sold in the market.

2. Mango slices constitute another product offering substantial prospects in the Belgian market. Discussions with certain speciality shops indicated their willingness to handle mango slices provided certain promotional support could be extended by the Indian exporters. Tropical fruits particularly mangoes are relatively unknown among Belgian consumers and their introduction would necessitate concerted promotional campaign initially. It was opined by the trade that a few trial consignments may be sent for distribution among selected outlets with a view to assessing the consumer acceptability of the product. It was, further suggested that a small leaflet indicating the special characteristics of these fruits as well as their usage will need to be distributed along with the samples. Besides mango slices, fruit cocktail is reported to be another item which could profitably be introduced in the Belgian market. Besides offering the product in attractive packages, it may be necessary to quote prices which are at par with the ruling prices of popular products like peaches, pineapples and apricots. Small quantities of mango slices are being presently imported into Belgium from Mainland China, their prices being in the neighbourhood of $ 5 for 24x2½. The cif prices of mangoes and guavas will need to be very competitive owing to the high duties imposed on imports from third countries, duties varying between 23% and 25% ad valorem depending on the size of the container. In addition, transmission tax at the rate of 15% is also imposed, being calculated on the the basis of total cif value plus custom duty.

3. The juice market has been showing steady improvement over the past five years, orange, grapefruit and grape juices being the more important products. Interest was shown in importing these juices from India. Belgium

is characterised by intense competition offered by traditional suppliers of these juices including Israel, Spain and USA. It was understood during the Survey that one of the leading firms handling processed juices in Belgium had experimented with the sale of Indian juices, efforts having met with little success. Though the quality of the Indian juices was found to be of a high order, price considerations affected sizable sales. Following prices would illustrate the point:

Product	Country	Pack	CIF Price
Orange Juices	USA	48x6 oz	$ 3.28
	USA (Natural)	24x20 oz	$ 3.50
	Greece (Sweetened)	"	$ 2.85
	Israel (Unsweetened)	"	$ 2.90
Grapefruit Juice	Israel	48x20 oz	$ 3.25
	Israel	24x20 oz	$ 3.90
	Israel	12x46 oz	$ 4.50

4. Imports of pickles & chutneys from India have been negligible though the usage of pickled and mustered vegetables is quite substantial. Presently Heinz brand of pickles & chutneys from UK is being imported in limited quantities, other important suppliers being Sherwoods of UK. The trade was of the opinion that Indian pickles and chutneys should be sent in light weight bottles with attractive labels.

2.6 UNITED KINGDOM

Background

UK annually imports two-thirds of the fresh fruit and one-third of its fresh vegetable requirements amounting to over 2 million tonnes and valued at $ 440 million, citrus, bananas, apples, grapes, pears, potatoes, tomatoes and onions accounting for the bulk of the imports. Netherlands, Spain, Poland, Jamaica, Israel, South Africa, Australia and France are the major suppliers of these items to UK.

UK market for food products today is undergoing rapid changes, the growth of convenience foods in recent years having outstripped the growth of general grocery trade. The imports of unprocessed items like meat, eggs and unmilled cereals have been declining in favour of fresh fruits, vegetables, sea foods and a wide assortment of delicatessen items reflecting a change in the eating habits of British consumers. A slowing trend, however, has been noticed in the demand for traditional processed fruits like peaches, pears and pineapples resulting in the growing demand for newer products like exotic foods and delicatessen items. Israel and China, for instance, have increased considerably their supplies of exotic items like avocado pears, aubergines, lychee wholes, bamboo shoots and meshed aubergines. Total imports of processed fruits and vegetables amounted to 696,000 tonnes over 1964-66 valued at $ 188 million, pineapples, peaches, apricots, pears, citrus segments, citrus juices and tomato products being the principal items entering the UK market. South Africa leads the processed items market of UK followed by Australia, USA, Israel, Italy, Japan, Malaysia and Singapore.

A. Fresh Fruits and Vegetables

India's Trade. India's exports to UK are mostly confined to mangoes and certain other unspecified vegetable items like tinda, parwal, karela and okra, shipments being despatched mainly by air. Total exports rose from 162 tonnes in 1965-66 to 660 tonnes in 1967-68, total value of exports in 1967-68 being $ 110,533.

Prospects. Considering the sizable population of Asian origin in UK and the general familiarity of English consumers with tropical fruits and vegetables, there is a definite possibility of building up UK as a major market in Europe for Indian horticultural produce. Further, all imports originating from Commonwealth countries enter the market duty-free under Commonwealth preferential arrangements. This is a decisive advantage India enjoys in the UK market as compared to fresh produce suppliers like Brazil, Argentina, Spain, Morocco and USA, whose exports face a stiff tariff barrier. Prospects as obtaining in the short-term, medium and long-term for Indian items are discussed below:

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Short-term Prospects

Mangoes. Annual imports of mangoes into UK are estimated at 200 tonnes. Kenya is the major supplying country followed by India and South Africa. Supplies from Kenya arrive during December-May period, from South Africa between February and May and from India during April-June. During 1967 season, India's mango exports to UK amounted to 81 tonnes valued at $ 26,186.

Mangoes are shipped by air from all these countries, since the fruit is extremely perishable. As compared to Kenya and South Africa, India is placed at a disadvantageous position in respect of freight rates for the flight distance is longer. While Kenya, for instance, pays $ 0.36 per kg of a minimum of 100 kg, India for the same weight has to pay $ 0.51. This has provided a competitive edge to Kenyan and South African suppliers.

Considering the large resident Asian population in UK and that there is already a well established micro-market for mangoes, it should not be difficult for India to accelerate mango exports to reach a level of about 1,000 tonnes by 1970-71. The essential pre-requisites in this respect are:

i) India, presently supplies mangoes at a price of 8 to 9 sh ($ 0.96) per kg to UK market. The price is rather high as compared to the South African and Kenyan offers, which reportedly rest around 6 sh per kg. Survey reveals that if the fruit has to reach the upper middle class and middle class groups in UK, a cif price of

5 sh per kg would be ideal. The major obstacle, however, in offering mangoes at such a price appears to be the high freight rate which, in fact, accounts for over 90% of the cif price. Freight subsidies therefore may have to be instituted, in the initial stages, to make Indian mangoes competitive in the UK market.

ii) Mangoes must be graded according to size, uniformity and variety and packed in cardboard cartons with each fruit wrapped in tissue paper. Each kg must contain 4-5 fruits of uniform quality.

iii) Selective sales promotion measures such as brand publicity, point-of-sale literature, advertisement in the trade journals etc should be undertaken to popularise mango as a dessert speciality.

Grapes. Imports of grapes into UK rose from 59,570 tonnes in 1964 to 67,688 tonnes in 1966. South Africa, with a 27% share, was the leading supplier followed by Spain, Cyprus and USA. Alphonso Lavelle, Regina, Walthom Cross, Almeira and Red Emperor constitute the main imported varieties.

Grape imports arrive both by air and sea, air shipments being more common mainly during off-season (February-May). UK off-season imports are reckoned at 5,000 tonnes per annum. India does not grow the seasonal varieties like Alphonso Lavelle, Regina etc and as such securing of a share in the market would necessarily be a long-term measure. However, exploration of the market for Indian table grape varieties like Anab-e-Shahi and Pusa Seedless should be made to meet a part of the off-season requirements. The Survey revealed that different suppliers use different packaging media, tray packing containing 10-11 lbs being the most popular medium. Turkey, however, sends its Rosaki variety in 16 lb tray. The average season price for French Alphonso Lavelle variety ranged between 10-11 sh per tray of 10 lbs and Italy's Regina variety was quoted at 13 sh per tray of 10 lbs. The off-season prices were much higher, having been quoted for South African Alphonso Lavelle variety at 24-25 sh per tray of 10 lbs and USA's Red Emperor at 60 sh per carton of 34 lbs. Keeping these prices in view, India should be in a position to undertake sizable exports during off-season.

Lychees. It was ascertained during the Survey that on an average South Africa supplies about 30-50 tonnes of lychees per annum during the season, that is December-February. Importers contacted during the Survey evinced keen interest in importing Indian lychees on a regular basis so as to prolong the lychee marketing season in UK right up to the end of May. Suggested cif price ranges between $ 0.50 and $ 0.60 per kg. Lychees are to be air-freighted, packed in cardboard cartons and each bunch properly protected by tissue paper wrapping.

Chickoos. It is reported that small consignments of chickoos are despatched to UK by air. Considering that it is a novel item, and that the population of Asian origin in UK may desire to have chickoos as one of the table fruits, it would be worthwhile attempting to export this item in larger volume to the UK market.

Onions. There is considerable demand for imported onions (dry-bulb) in UK, throughout the year. UK, in fact, is the principal market for onions in Western Europe with an average annual import of 200,000 - 215,000 tonnes. Spain, Netherlands, Egypt and Poland supply over 80% of the UK requirements. Mild flavoured bulbs known as the Spanish white onions are most popular amongst the British consumers. During February 1968, Spanish onions were being quoted at a price of $ 50 per tonne cif while Hungarian and Polish produce was quoted at $ 100 per tonne. Onions are imported into UK packed in string bags, sacks, straw hampers or wooden crates. As per the agricultural produce import regulations onions are to be graded for size and uniformity and the correct weight has to be declared on the packages, due allowance having been made for any loss of weight during voyage.

It seems, India has not been exporting onions to UK mainly because the required varieties are not grown in the country. Considering that it is possible for India to produce and export medium sized white onions and that importers in UK are agreeable to import this item from India, vigorous attempts have to be made to build up a regular export trade in onions in the UK market.

Other Vegetables. Excluding potatoes, tomatoes and onions, UK annually imports about 150,000 tonnes of assorted fresh vegetables which include cucumbers, capsicums, French beans, aubergines, cabbages, cauliflowers and salad-type-vegetables. These vegetables are usually supplied by countries like Portugal, Cyprus, Netherlands, France and Malta. In recent years, however, African countries like Uganda, Ethiopia, Kenya and Morocco have entered the West European markets including UK with fresh vegetable supplies. These countries usually send their vegetables by air, on weekly basis.

India too, under a suitable programme of air-freighting fresh vegetables to European markets, should keep UK in view as an important buying country. Under such a package programme, it would be possible for India to export items like aubergines, capsicums, yams, french beans, okra, tinda, parwal, karela and all the salad-type-vegetables.

Medium and Long-term Prospects

Citrus. Imports of oranges, tangerines, lemons, limes and grapefruit have been showing a steady rise over the last three years, imports of oranges and tangerines, for instance, having risen from 410,000 tonnes in 1964 to 421,000 tonnes in 1966 and that of grapefruits from 74,000 tonnes to 77,000 tonnes.

Major suppliers of these items include Spain, Italy, South Africa, Brazil and Cyprus, mandarin supplies of 23,430 tonnes in 1966 being supplied mainly by Spain and Morocco. Grapefruit market is dominated by South Africa and Cyprus though limited quantities have also been imported from Trinidad and Swaziland.

In UK, Valencia Late, Shamouti, Washington Navel, Disa and Protca are the preferred orange and tangerin varieties; in grapefruits, though Marsh Seedless still holds the market, American pink varieties are reported to have become very popular in recent years. Italian Speciali and Primfiore, Spanish Greens and Italian Ogens are the important lemon varieties sold in UK.

Citrus import prices in UK during February 1968 were as follows:

Import Prices of Citrus Fruits in UK (February 1968)

Sources of Supply	Pack size	Cif price in $
Oranges		
Cyprus, Oval	Br. box/carton 56/144	2.40
Israel, Shamouti	Br. box/carton 60/126	2.58
Morocco, Blood	Br. box 88/190	2.16
Spain, Navel	Box 126/360	4.32
Morocco, Mandarin	Box	1.92
Grapefruit		
Cyprus, Marsh Seedless	½ box/carton 32/80	1.80
Israel	Br. box 40/100	1.92

contd....

Sources of Supply	Pack size	Cif price in $
Lemons		
Cyprus	Carton 90/180	1.56
Israel	Carton 70/200	1.44
Italy	Carton, Br. Box 70/180	1.68

There is no commercial production of any of the above mentioned varieties in India presently. There exists, however, a considerable production of mandarins, Maltas, Mosambis and limes, whose export prospects have yet to be confirmed. It may be worthwhile in the short-term to test their acceptability in the first instance in the UK market and to follow it up with regular exports in view of the general familiarity of the English consumers with these items. It was reported during the Survey, for instance, that some of the British importers had made efforts to secure supplies of these items but the response from the Indian side was not encouraging. Consignments arrived in UK mostly in damaged or putrefied condition; packaging was very poor and fruits did not conform to any specific standards.

In order to exploit the growing market that exists in UK for citrus items, it is necessary that considerable improvements may have to be undertaken in the production and handling of citrus fruit for exporting to UK market. Fruits have to be packaged in cartons or bruce boxes so as to meet the exacting requirements of the market. Best season for exports from India would be during May and September.

B. Processed Fruits and Vegetables

India's Trade. India has been exporting numerous varieties of processed fruits and vegetables to the UK market, which has been the traditional selling point for Indian products to the whole of Europe. Though small quantities have been moving to other European capitals, most of their demand for these products has been generally met through UK trade houses, who have been traditionally handling Indian products. The following table indicates the exports of Indian canned fruit and vegetable items to UK during the period 1965-66 and 1967-68:

Exports of Indian Processed Fruits and Vegetables to UK 1/

Quantity:Tonnes
Value:Thousand Dollars

	1965-66		1966-67		1967-68	
	Quantity	Value	Quantity	Value	Quantity	Value
Jams and jellies	7	2.8	25	10.7	47	25.7
Fruit juices	6	5.3	44	19.6	118	32.0
Mango pickles and chutneys	838	183.0	1,027	322.6	825	276.4
Mango slices in brine	497	66.0	165	34.5	144	31.5
Other fruits and vegetables preserved	421	127.2	437	186.8	409	197.5
Total	1,769	343.3	1,698	574.2	1,543	563.1

1/ DGCIS, Calcutta

Indian mango pickles and chutneys with sugar constitute the most important item exported from India to UK, followed by mango slices in brine, mango pickles and chutneys without sugar and vegetable pickles. Others include fruits preserved by freezing, fruits preserved in syrup and canned vegetables. Mango slices in brine are being imported by a few British packers for processing and packing of chutneys and pickles under their own labels. Products going in retail packs include vegetable pickles, mango slices, guava slices and canned vegetables. Exports of these items have, however, not been very substantial despite the fact that there is a large concentration of Asian population in Britain.

Prospects. The UK market offers increasing prospects for the sale of typically Indian products like mango chutneys, pickles, canned vegetables, mango in slices, guava in slices, lychee wholes, mango, guava and lychee juices. Though some quantities of these products have been moving to UK, the available potential remains to be adequately tapped. This view was expressed by most of the traders handling Indian products in Glasgow, Liverpool and London. Besides 300,000 Indians and Pakistanis, there are those from other Asian countries settled in UK whose food eating habits are similar to those of Indians. There are also about 3,000 Indian and Pakistani restaurants operating in UK which could prove to be a very vital outlet for popularising Indian products. Further, British consumers generally are familiar with Indian processed items and thus a general acceptability of the products was evident during the Survey.

Short-term Prospects. The market offers adequate scope both for introduction and expansion of a variety of processed fruits and vegetables. Besides expanding the sale of Indian pickles and chutneys, mango and guava slices, canned vegetables and other tropical fruit preparations, UK market offers adequate prospects for the sale of pineapple items. The market for processed pineapples is fairly large, annual imports having averaged 60,000 tonnes during 1964-66. The pineapple market is dominated by Malaysia, Singapore and South Africa. The popular type of canned pineapple sold in the market comprise Smooth Cayenne variety and the Queen variety. The samples of Indian pineapples which were shown to a few import houses were found acceptable and it is believed that India should be in a position to sell large quantities of pineapple slices if offered at a cif price of $ 6 for 24x2½.

The sale of tropical processed fruits and vegetables like mangoes, guavas and lychees and vegetables including parwal, karela and tinda can be stepped up considerably in the immediate future provided Indian exporters are prepared to meet the requirements of the British market in terms of quality, price and promotion. Australia, for instance, has been able to come up as the second leading supplier of processed fruits and vegetables to UK market in recent years mainly on the basis of aggressive selling and intensive promotion done by the Australian Canned Fruit Board as well as individual exporters. Australia undertakes extensive generic and branded publicity through advertising in trade and consumer press, television, demonstrations and point-of-sale material. Likewise South Africa, whose stakes are the highest in UK market, spends large amounts of money on efforts aimed at promotion and publicity. With a view to stepping up the exports of these items, it would be necessary for India to allocate considerable amounts for sales promotion in the UK market. A well organised and systematic campaign would be required for introducing these products on a large scale.

Medium and Long Term Prospects. UK has been increasing her imports of items like mandarin orange segments, grapefruit sections, peaches and tomato puree. The exploitation of the potential for these items in the medium and long term will be based on commercial production of the right variety of fruits and the installation of modern processing capacity. Should India be in a position to produce a competitive product as against those emanating from Australia, South Africa, Japan and Israel, UK could prove to be a very important outlet in the coming years.

The UK canned fruit market is somewhat static at present and the level of competition at all channels reveals no sign of abating. Though USA has not been able to win back its pre-war dominating position, competition from this quarter will always remain a potential threat to the Australian and South African exporters. It is, however, felt that if South Africa is denied Commonwealth preferences at some stage, it would have a significant impact in minimising the price advantage it presently enjoys. This will also open up new opportunities for countries like India.

The changes taking place in the distributive scene as discussed at Chapter 5.6 of Volume I of the Report, are likely to bring about rapid reduction in the number of brands, simplification of the channels of distribution and the increasing importance of labels.

Against the above background, it is believed that UK market could become a much more important outlet for Indian products. Sales of traditional as well as new products could be stepped up considerably and the following suggestions are made for accelerating this process:

1. Prices of the major processed fruits and vegetables, both imported and domestically produced, are furnished at Volume IV, Table B-4.5 of the Report. This data would need to be closely studied by the interested exporters with a view to offering competitive prices. An idea of the current prices of some of the popular items can be had from the following:

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Product	Description	Packsize	Distributors Prices in $
Peaches, Slices	Del-Monte Canned Fruits	24/1, Tall	1.98
Peaches, Halves	-do-	24/2½	3.24
Peaches, Halves	-do-	24/1, Tall	2.01
Pineapple Slices	-do-	24/1¼	2.10
Pineapple Slices	-do-	24/2	2.31
Fruit Cocktails	-do-	24x16 oz	5.52
Pineapple	Libby's Sliced Pineapple	24/2½	6.24
	Libby's Sliced Pineapple	24/1, Tall	3.84
	Libby's Pineapple Juice	12/46	3.92
Fruit Cocktail	Libby's Fruit Cocktail	24/2½	7.82
	Libby's Fruit Cocktail	24/1, Tall	5.08
Orange	Libby's Sweetened Orange Juice	12/43	4.44
	Libby's Sweetened Orange Juice	24/2	3.92

2. The Survey revealed that most of the countries including Australia and South Africa who have considerable stakes in UK and other European markets, normally market their products under one brand. Promotion and publicity is directed through one organisation like South African Canned Fruit Board and Australian Canned Fruits Board. It is only this kind of a quasi-governmental organisation that could subsidise and sponsor promotional activity on sufficiently large scale to make a significant impact on an important market like UK. It is, therefore, suggested that the Export Promotion Council for Processed Foods should encourage the establishment of a Consortium of exporters of Indian processed fruits and vegetables with a view to marketing their products preferably under one brand in European markets. The competition is intense which can be met only through an organised effort.

3. Trade discussions held in UK indicated that a policy aimed at selectivity and concentration needs to be adopted by the Indian exporters in respect of UK market. It would be useful to concentrate on the marketing of a few selected products which appear to show immediate potential. Activity would need to be initially generated to create awareness of Indian products both among trade and consumer press through generic publicity.

2.7 SWITZERLAND

Background

Average annual imports of fresh fruits and vegetables totaling 504,000 tonnes valued at $ 113.2 million, represent the total demand for imported fresh produce, re-export being negligible. Principal items entering Swiss market include oranges, bananas, grapefruits, grapes, peaches and tomatoes, lettuce, onions, potatoes and cauliflowers chiefly emanating from Italy, Spain, Israel, South Africa, Argentina and neighbouring countries of Europe as well as Honduras, Guatemala, Colombia and Ecuador.

Switzerland presently offers a limited market for processed fruits and vegetables, total imports having averaged 52,000 tonnes value at $ 21 million during 1964-66. Pineapples, peaches and fruit cocktails comprise the major items of import. Total imports of different varieties of processed fruits rose from $ 6.5 million in 1960 to $ 9.1 million in 1966, registering a rise of 55% over the period. With the sole exception of pineapples which accounted for 25% of the total imports of processed fruits in 1966, the share of other tropical fruits has been negligible. The Survey revealed that the market is expanding and is capable of absorbing a number of new products, especially of tropical varieties provided they are systematically introduced. Pineapples, for instance, were hardly known among the Swiss consumers till World War II but today it has come to stay as a top selling item among imported processed fruits. The demand for food items has been flexible, being dependant to a large extent on the nature and the price of the product offered.

Consumer Preferences. Before outlining specific prospects which Swiss market offers for Indian products, it might be useful to detail a few characteristics of the Swiss consumer:

i. Swiss consumer according to the studies undertaken by the Swiss Office for Development of Trade is very exacting in the matter of quality, a number of new products introduced by the developing countries in the recent past having failed to get acceptance owing to the differences in taste and sub-standard quality. An average buyer, though concerned with the price, is normally prepared to pay higher price for a superior quality product. It has also been indicated that the appearance of a product is a very vital factor for consumer acceptability in Switzerland. Careless cutting of pineapples was cited as an instance.

ii. Brand loyalty constitutes another important consumer characteristic in Switzerland. Hawaiian variety of pineapples has been a popular variety, pineapples from Philippines, Kenya, South Africa and Taiwan having failed to get acceptability on account of differences in texture and acidity as against Hawaiian pineapples. Systematic and concerted long phased promotional campaigns undertaken by the above mentioned countries with a view to educating the consumers about the properties of pineapples from their countries, have lately succeeded in overcoming the initial consumer resistance. Today Taiwan, Kenya and South Africa are selling large quantities of pineapples in the Swiss market.

iii. High priced products sometimes fail to move in the market. Mango slices from India, for instance, have not been imported in substantial quantities in view of the disparity in prices between Indian products and those of South Africa. The price of a 2½ size tin of mango slices from India was $ 0.80 as against $ 0.55 of South Africa.

A. Fresh Fruits and Vegetables

Prospects. Swiss import potential for fresh horticultural produce is indeed enormous but India's performance in the market has so far been poor. Obviously there have been several built-in limitations which an Indian exporter has to face in the Swiss market. The market is highly cometitive both in terms of price as well as quality. The Swiss consumer is choosy and selective, sophisticated packaging being yet another important criterion for competitive selling. Excepting in the case of oranges and pineapples, all consignments will have to be air-freighted which involves additional costs. Notwithstanding these limitations, Indian exports could be stepped up, at any rate, in selected fields. The scope for such selective sales is discussed below:

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Mangoes. The available data indicate that the quantum of mango imports into Switzerland is negligible. India's efforts to export mangoes to Switzerland have been limited to sending a few trial consignments. These supplies evoked considerable interest; the market acceptance for mangoes would be a slow process on account of the newness of the items. The Survey revealed that the trial consignments of mangoes sent by Indian exporters did not meet fully the rigid requirements of the Swiss consumer in terms of quality, fruits having considerably deteriorated in transit on account of inadequate packaging.

Discussions held with importers in Switzerland revealed that if superior varieties such as Dussehri and Chousa are exported from India, it would be possible in the long run to develop a base market for this item. Mangoes will have to be air-freighted to this market, and offered at a c.i.f. price ranging between $ 0.80 to $ 1.00 per kg.

Oranges & Mandarins. Imports of oranges and mandarins into Switzerland ranged between 95,000 to 100,000 tonnes per annum during 1964 and 1966 respectively. The main suppliers to this market were Italy, Spain, Israel, Brazil, South Africa, Tunisia and Cyprus, Italy and Spain having accounted for nearly 80% of the total imports.

The Survey revealed that of the total citrus imports, over 85% account for oranges and clementines and the rest mandarins. Annual demand for mandarins in the Swiss market can be placed at over 10,000 tonnes, Italy and Spain being the major suppliers. Harvesting periods for mandarins in

Spain and Italy are November to January and December to January, respectively, as against May to November for Indian Coorg mandarins and Nagpur santras. There is thus a good off-season market available for India.

Mandarins should be properly graded and packed in Bruce boxes or cartons of 20 kg each, to be transported by refrigerated vessels. During January 1968, c.i.f. price for imported Spanish mandarins was around $ 23 per quintal. India can gain a foothold in the market in a limited way initially but long term prospects in citrus market would depend mainly upon India's ability to grow varieties like Washington Navels and Valencia Lates.

Limes. Annual imports of lemons into Switzerland were about 18,000 tonnes between 1964 and 1966, there being no imports of limes presently. Italy, Spain, USA and Israel were the chief supplying countries.

During the Survey, quite a few Swiss importers evinced interest in Indian limes as they feel that consumer preference for this item can be developed due to their being juicy, smooth and thin skinned.

Trial consignments of Indian limes, therefore, should be forwarded to Switzerland for ascertaining consumer acceptance. Limes, for this purpose, should be packed in polythene bags containing 5 and/or 12 fruits. Twelve such bags should be packed in a cardboard carton. These should be air-freighted.

Grapes. Imports of table grapes into Switzerland increased from 31,695 tonnes in 1964 to 38,388 tonnes in 1966, Italy, France, Spain and South Africa having met the bulk of requirements.

Major proportion of imports of grapes takes place during the months of June-November, which is the grape harvesting season in Europe. The off-season for grapes begins from December and ends in May. During this period Spain and South Africa are the only suppliers of grapes to Switzerland, total off-season market having been estimated to range from 4,000 to 5,000 tonnes. The main varieties of grapes imported by Switzerland during the off-season are Alphonso Lavelle, American Tessina and Spanish Chassels and Aledo. The Survey revealed that the average c.i.f. price of grapes in this market ranged between $ 0.57 to 0.69 per kg.

India's prospects for export of grapes to Switzerland are rated fairly good as grape harvesting season in India coincides with the off-season in Switzerland. Attempts should be made expeditiously to send trial consignments of Indian varieties like Anab-e-Shahi and Gulabi to this market for ascertaining consumer acceptability. As a long-term proposition, however, it would be necessary to initiate plans for growing varieties which are popular in Switzerland; typically Indian varieties may achieve only a limited volume of exports.

The export consignments of grapes should be packaged in 5 kg cartons. Each bunch needs to be protected separately. Grapes should be air-freighted.

Pineapples. Imports of pineapples into Switzerland are reported to be small in volume. Discussions with major importers of fresh fruits revealed that at present pineapples are being supplied mainly by Ivory Coast and Brazil.

A few trial consignments of fresh pineapples were sent from India to a major Swiss importer in 1966. It was felt that despite good appearance and juicy quality, Indian pineapples were not acceptable due to unwieldy size. Swiss consumers prefer fruits of smaller size. Brazilian pineapples were reported to weigh only 1 lb. each. The weight of each pineapple in no case should exceed 1 kg.

The Survey revealed that pineapples are sold mainly during the months of November, December and January in Switzerland. Pineapples meant for the Swiss market should be sent by refrigerated ships and offered at a c.i.f. price of $ 0.69 per kg.

If vigorous efforts are made by Indian exporters, it would be possible for India to export 100 to 200 tonnes of pineapples per annum in the initial stages itself.

Lychees. It is understood that current imports are very limited mainly originating from South Africa. It should be possible to develop a small market in Switzerland for this item, if offered at a price of $ 1.03 per kg.

Vegetables. Switzerland imports a wide variety of fresh vegetables to the tune of 130,000 tonnes per annum. Aubergines, capsicums, paprika, fresh beans, asparagus and artichokes are some of the important fresh vegetables supplied by the European and African countries to the Swiss market. If regular arrangements are made to air-freight such items, India can secure considerable share of the market.

B. Processed Fruits and Vegetables

India's Trade. Exports of Indian processed items to Switzerland are negligible, having declined from 25 tonnes in 1965-66 to 15 tonnes in 1967-68. Total value of exports during 1967-68 was of the order of $ 150,000. Dried mushrooms are the most important item exported presently from India, having accounted for 75% of the total trade during 1967-68. Very small quantities of mango pickles and chutneys have also been moving to Switzerland, total exports during 1967-68 being 3 tonnes. No serious efforts aimed at exporting larger quantities of Indian products to Switzerland have ever been made by the Indian exporters with the sole exception of a few trial consignments having been despatched in 1966. The Swiss market for processed items is growing and a trend towards the increasing consumption of tropical fruits is discernible reflecting possibilities for the sizable sale of Indian fruit and vegetable items.

Prospects. The Survey revealed that the Swiss market offers prospects for tropical canned fruits including mango products, guava products and tropical fruit salads, canned okra, pickles and chutneys, pineapple slices and juices and juice concentrates.

Though present imports of tropical fruits are negligible with the sole exception of pineapple products which constitute one of the growing items in the Swiss market, the Survey revealed that considerable sales of the above mentioned products could be built up if systematic sales campaigns are undertaken in the Swiss market with a view to creating a proper image for India as a supplier of these products.

Efforts made in the past for the sale of mango pulp, mango slices and tropical fruit salads met with very little success on account of uncompetitive prices and absence of promotional support. Discussions held with the traders indicated their willingness to handle the above products from India provided prices were competitive and quality acceptable. For a systematic introduction of the Indian products, following suggestions will need to be implemented:

1. MIGROS, which is the largest cooperative chain store in Switzerland accounting for 30% of the total food market, would prove to be an effective outlet for the introduction of Indian tropical fruits and vegetables. Discussions with MIGROS indicated their willingness to promote Indian products on the basis of acceptable quality and adequate promotional support. As MIGROS normally sell food products under their own label, the interested Indian exporters will be obliged to agree to this arrangement. Adequate promotional budgets will need to be allocated to MIGROS initially for a period of one year for organising demonstrations, counter displays, distribution of leaflets, press advertising and mail publicity. A minimum of $ 15,000 would be required for this effort during the first year. USC, large-scale voluntary chain in Switzerland could also be contacted for the purpose discussed above. They are also willing to sell and promote Indian tropical processed fruits and vegetables under these arrangements.
2. It has been indicated earlier that though the Swiss consumer is exacting in matters of quality standards and brands, inducements in the form of lower prices and acceptable quality could make him shift to newer brands and products. The Survey revealed that Indian mango slices could not make an impact over the market on account of the uncompetitive prices; a 2½ size can of mango slices from India is retailed at $ 0.80 as against $ 0.55 of South Africa. Further, mango slices are

likely to be compared with popular fruit items like peaches and cocktails in terms of prices thus making it necessary for their prices to be at par with those of peaches and cocktails. Following were the prices of the major items sold in the Swiss market during February 1968.

	Size	CIF Price ($)
Taiwan Pineapple Slices	24 x 2½	4.95
Del Monte Pineapple Tidbits	24 x13½	2.55
Del Monte Pineapple Juice	"	1.60
South African Peaches	24 x 2½	5.80
Californian Peaches	"	7.00
Italian Pears	"	6.60

3. HOVEGA, an apex organisation for catering establishments in Switzerland, buys considerable quantities of processed fruit and vegetable items for the requirements of its members. Indian manufacturers interested in expanding their sales in Switzerland may get in touch with this organisation for working out regular arrangements for the supply of processed fruits and vegetables in bulk quantities.

4. The Survey revealed that a number of corporate chains operate canning plants for the manufacture of processed items for sale in their stores. Sales of mango nectar which is already moving in the Swiss market in a limited way, could be considerable if sold under an established local brand. It is, therefore, suggested that Indian manufacturers of mango pulp may contact the canning units in Switzerland for the regular supply of mango pulp for manufacturing mango nectar.

5. Promotion and publicity particularly for new products, is essential in Switzerland. The importance of publicity and promotion has risen manifold in the recent past in view of the operations of large buying groups in Switzerland who demand and require adequate publicity budgets before opting to sell a product.

It might be worthwhile to organise Indian National Weeks in collaboration with selected leading stores for promoting Indian food items. These campaigns besides building up adequate sales for processed items, would be useful in creating a better image for India among Swiss consumers.

2.8 SWEDEN

Background

Sweden figures as a prominent importer of fresh fruits and vegetables among the Scandinavian countries with an average annual import of 477,000 tonnes in 1964-66 valued at $ 83.4 million.

In respect of processed fruits and vegetables Sweden constitutes the largest consuming market in the whole of Scandinavia, total imports having averaged 51,000 tonnes valued at $ 18.6 million during 1964-66. Major items of import include peaches, pineapples, pears, apricots, fruit salads, citrus and other fruit juices among fruits and tomato products, mushrooms, sprouts and asparagus among vegetables. Besides neighbouring European countries, principal suppliers of processed items to the Swedish market include Taiwan, USA, South Africa, Philippines, Mainland China, Japan and Australia.

A. Fresh Fruits and Vegetables

India has not so far exported fresh produce to Sweden. Nor has she made any attempts to explore the growing Swedish market. Items showing adequate export prospects are discussed below:

Mangoes. Importers contacted during the Survey felt that mangoes could be sold in sizable quantities in the Swedish market provided attempts are made to popularise the fruit and are offered at prices, relatively competitive to peaches and pears. A leaflet, describing the characteristics and uses of mango, distributed at the point-of-sale, must form an essential part of any promotional campaign. Suggested average c.i.f. price for mangoes is $ 0.50 to $ 0.75 per kg. Fruits are to be individually wrapped in tissue paper and packed in compartmentalised cardboard cartons and air-freighted.

Grapes. Swedish imports of table grapes emanate mainly from the West European countries during the season; in the off-season period, they are imported mainly from Argentina, Chile, USA and Australia. In 1967, table grapes imports were of the order of 26,686 tonnes valued at $ 8.1 million. Italy held the major share of the market with an export of 10,376 tonnes followed by Spain 9,172 tonnes and Bulgaria 1,398 tonnes. Of the total off-season imports of 5,435 tonnes, USA and Argentina supplied each about 1,390 tonnes and the rest was divided among Cyprus, Australia and South Africa. Important varieties preferred in this market include Alphonso Lavelle, Rozaki, Aledo and Red Emperor. Import prices during the season range between $ 0.25 to 0.30 per kg while in the off-season they reach as high as $ 0.50 per kg. Grapes are usually sent by refrigerated ships packed in cardboard cartons.

Though India cannot presently supply the varieties required by the Swedish market, efforts should, however, be made to export the Indian table grape varieties like Arab-e-Shabi, Muscat and Gulabi. Trade circles appear to be receptive to the idea of introducing them in the Swedish market.

Citrus. Imports of oranges, grapefruits and lemons into Sweden were valued at $ 26.1 million during 1967. The lion's share in the citrus imports was held by oranges with a total value of $ 23.7 million; both lemons and grapefruits accounted for only about $ 2.4 million.

Imports of oranges, which averaged 112,000 tonnes between 1964-66, were mainly supplied by Spain, Italy, Israel, Morocco and Cyprus. During the European lean months, supplies come from Brazil, USA and South Africa. While Spanish Navels and Israeli Shamoutis are the preferred varieties in the Swedish market, consumer preferences are not considered so inflexible as in the other European markets. The market is capable of absorbing a wide variety of oranges and tangerines.

With regard to lemons, imports comprise mainly the thick skinned variety coming from Cyprus, Italy and USA. Annual imports of lemons into Sweden average 6,000 tonnes.

About 4,500 tonnes of grapefruits are imported annually from Israel and USA. The varieties include Marsh seedless and the pink coloured grapefruits. Cif prices of citrus fruits in Sweden during 1967-68 were as follows.

Cif Prices of Citrus Fruits in Sweden

Source of Supply	Packing	Cif Value $
Oranges		
Spain	30 kg carton	5.70
Italy	30 kg Bruce box	7.50
Israel	19 kg carton	3.61
USA	30 kg Bruce box	7.50
Morocco	30 kg carton	9.20

Contd...

	Packing	Cif Value $
Grapefruits		
Israel	19 kg carton	3.61
USA	20 kg carton	4.80
Lemons		
Italy	12 kg carton	2.40
Israel	19 kg carton	3.80
Cyprus	12 kg carton	2.64

Considering that Sweden imports a wide variety of oranges and tangerines and that prices are considerably attractive, India should make a concerted effort to penetrate into the Swedish citrus market. Except on lemons, there are no duties imposed on other items. Attempts should also be made to introduce Indian limes in the Swedish market.

B. Processed Fruits and Vegetables

India's Trade. Exports of Indian processed fruits and vegetables to Sweden have been very negligible, total exports comprising mainly mango pickles and chutneys having declined to 41 tonnes in 1966-67 from 60 tonnes in 1965-66. The Swedish market has thus remained unexplored in respect of Indian products including mango and guava preparations.

Prospects. Total imports of processed fruits and vegetables including canned fruits, juices and jams and jellies averaged 40,000 tonnes valued at $ 14 million during 1964-66. Major items entering the Swedish market include fruit juices, peaches, fruit cocktail, pineapples, pears, apricots and citrus segments. While the imports of juices comprising mainly citrus items rose from 10,715 tonnes in 1964 to 14,213 tonnes in 1966, the corresponding rise in canned fruits was from 25,907 tonnes to 29,064 tonnes. Peaches constitute the most important item in the canned fruit sector with a share of 28% in 1966; USA supplied approximately 79% of the total imports during 1966. Pineapples, on the other hand, were supplied to the extent of 38% in 1966 by USA, the remainder being shared among Philippines, Taiwan and China (Mainland).

Citrus segments market is dominated by Japan. Citrus juice, the market for which has grown rapidly over the years, is mainly catered to by Israel, USA, and Spain, Israel having accounted for the bulk of the imports. The Survey revealed that 60% of the total imports of fruit juices are in concentrated form for the use of industrial consumers.

Trade discussions indicated that India could enter the trade in respect of citrus juices and popular fruits like peaches, pineapples, apricots, pears and citrus segments. The capability of India to enter this market will mainly depend upon the setting up of modern units having adequate production capacity for these items in the years to come. Pineapple slices, however, are an item of immediate interest and a number of importers showed considerable interest in importing from India. Should India be in a position to offer pineapple slices at $ 5.50 for 24x2½, prospects appear to be bright.

The consumption of tropical canned fruits in Sweden has been upward in the recent past, especially processed pineapples. A gradual trend towards the consumption of newer and different products including exotic processed fruits is discernible owing to the rising personal income in the country.

During the Survey discussions were held with a number of organisations handling the sale of processed fruits and vegetables in the country including Kooperativa Forbundet and ICA. These organisations showed interest in receiving trial consignments of typical Indian products like mango and guava products from India. They were prepared to experiment with the Indian products, quality and prices being competitive. Some of the samples of Indian products shown to them evoked interest and a few suggestions aimed at product modification as per the Swedish requirements were volunteered. The comments made by Kooperativa Forbundet on some of the items tested by their buyers are as follows:

Pineapple Juice: is too grey-yellow and too sweet

Orange Juice Single Strength: is too yellow-red and excessively sweet and off taste.

Mango Slices: Product is good but the pieces were too un-even; very sweet and the consistency excessively soft.

Chickoo: Very sweet taste.

Pineapple Slices: The taste is sweet and not aromatic. Some of the slices were found to be very hard.

Besides keeping the above comments in view, the following steps will need to be initiated with a view to capturing a share of the growing Swedish market for processed fruits and vegetables.

1. Details about the retail trade structure as well as wholesale operations in Sweden have been furnished in Volume I (Part B) of the report. Buying function in Sweden having been concentrated among a few wholesale organisations, introduction

of new products has become relatively easier. Discussions were held with organisations like KF and ICA who showed definite interest in handling Indian products. It is suggested that interested Indian manufacturers may get in touch with these organisations with a view to interesting them in their lines of product. Initially it would be very necessary to forward trial consignments for ascertaining the reactions of selected retail outlets.

2. The operation of international brands like Libby's and Del Monte in Sweden through well organised distributing agents has rendered the market intensely competitive. While their products sell mainly on the basis of brand and established reputation, countries like Australia, Mainland China and South Africa have been able to make a dent into the market on the basis of lower prices and aggressive promotional effort. It was, for instance, indicated that Del Monte incurred an expenditure of $ 40,000 on sales promotion during 1966. Voluntary chains and buying groups operating in Sweden require sizable publicity budgets for the introduction of new products. Normally they do not take up a product unless certain inducements like price reductions, promotional budgets, etc. are offered.

3. Price has come to play a very important role in the sale of certain products especially pineapple slices. It would be interesting to examine some comparative prices of major suppliers of principal products.

Pineapple Products

Country	Product	Pack	Price $
USA	Pineapple juices	23x30 oz	5.95
Formosa	Pineapple slices	24x30 oz	4.90
Philippines	Pineapple slices	24x30 oz	5.30
Ivory Coast	Pineapple slices	24x30 oz	5.82

Contd....

Country	Product	Pack	Price ($)
Peaches			
USA	Peaches	24x16 oz	4.80
Australia	Peaches	24x16 oz	4.30
Citrus Juices			
USA	Orange juice	24xNo.2 (18 oz)	3.80
USA	Grapefruit juice	"	3.80
Israel	Orange juice	24xNo.2 (18 oz)	3.15
Israel	Concentrated Citrus Juices (1x6)	Tonnus	5.80
Mandrin Orange Segments			
Japan	Mandrin Orenge Segments	48x11 oz	6.86
China	-do-	"	5.60
Fruit Cocktails			
USA	Fruit Cocktails	24x16 oz	5.00
Australia	-do-	24x30 oz	4.30

It is clear that prices of the products emanating from Taiwan, Israel and Australia are relatively lower than those from USA, which explains to a major extent the successful penetration of these countries into the Swedish market. Prices of Indian products like mango slices would need to be at par with those of peaches and pears.

4. Discussions with importers interested in mango slices from India indicated that a well organised campaign will need to be initiated for introducing canned mango slices from India, mango being an unknown product in Sweden. The campaign would include the following:

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a. A limited product test for mango products should be organised in Sweden. The spread of the sample should be adequate so as to include a minimum of two to three cities in Sweden including Stockholm, Malmo and Gothemburg. Approximately 2,000 housewives would need to be approached with a small questionnaire, which could be filled in and collected after 10 days. This would be given along with a sample so that questions relating to their eating habits, the frequency of canned food consumption and the method of eating them could be ascertained. The product test would indicate in concrete terms the initial reactions of the consumers to these products so that necessary product modifications could be carried out for meeting the consumer requirements of Sweden.

b. It would be necessary to have consumers' ideas about the pack at the time of product testing so as to conform the printing and presentational aspects to the exacting requirements of Swedes. The trade could also be requested to look at the labels and give their opinion on various aspects including the following:

   i. Is it attractive and suitable for the Swedish taste;

   ii. Is it possible to recognise what it contains.

c. Based on the findings of the above two steps, the test marketing of the product could be organised in collaboration with a multiple group for a period of 3-4 months. Products could be given to the firm on a consignment basis initially with adequate promotional support.

d. If the results of above efforts are encouraging, a controlled product test could be undertaken so as to give an opportunity to the consumers to rate a similar product with mango slices. For instance, peaches could be given over to the house-wives so that they can rate these two products relatively.

e. At the time of test marketing it is most desirable to have documentation of the products so as to ascertain the sales of the product in various retail outlets. The advertising and publicity to be undertaken at the time of test marketing would include the distribution of small leaflets indicating the various uses this product can be put to and the methods of using it.

5. The total campaign might cost around $ 10,000 including the cost and shipment of samples. Sweden is one of the richest countries of the world and thus could offer adequate scope for the sale of Indian products. It was estimated by a leading importer that India should be able to sell 50,000 cases of mango slices within a period of one year if marketing is done in a systematic manner and the product introduced scientifically.

2.9 DENMARK

Background

Danish imports of fresh fruits and vegetables averaged 153,000 tonnes ($ 34 million) comprising 125,000 tonnes of fresh fruits and 28,000 tonnes of vegetables. Citrus, bananas, apples and grapes were the main items of import, Spain, Italy, France, Brazil, Australia, South Africa and Israel being the principal supplying countries.

Denmark is a small market for processed fruits and vegetables, imports having averaged 63,900 tonnes during 1964-66. Imports represented 60% of the total aggregate consumption of fruit preparations during the period. Major items include peaches, pineapples, apricots, citrus segments, fruit cocktails, pears, and citrus juices among fruits and tomato products, asparagus and mushrooms among vegetables. Principal suppliers include USA, Taiwan, Australia, Italy, Netherlands and Mainland China.

A. Fresh Fruits and Vegetables

Prospects. Considering that a sizable share of Danish imports originate from the other hemisphere countries and that India too has similar range of items and harvesting seasons, it should be possible for her to tap the market potential especially in view of her distinct geographical advantage. Survey revealed that the items discussed below could be exported from India with advantage in the short term.

Oranges. Denmark imports on an average 46,000 tonnes of oranges and tangerines per annum of which 40,000 tonnes are supplied by Spain and Israel, the remaining 6,000 being made up by supplies from Brazil, South Africa and Morocco. Preferred varieties in the Danish market are Spanish Valencias and Israeli Shamoutis. Following import prices were quoted in the Copenhagen market during January 1968:

Import Prices of Oranges in the Copenhagen Market

Variety	Source of Supply	Weight	Cif Price in $
Sandra	Spain	30 kg	4.00
Sanguina	Spain	30 kg	3.86
Jaffa	Israel	19 kg	2.27
Valencia	Spain	30 kg	4.53
Washington Navels	Brazil	18 kg	2.33

Importers contacted during the Survey evinced interest in securing supplies of Indian mandarins during the off-season (May to October). With a view to ascertaining the consumer acceptability of the Indian mandarins, it is considered necessary to send some trial consignments to selected importers in Denmark. The Survey also revealed that Indian Mosambis and Maltas could be introduced into this market provided well graded fruits packed in bruce boxes could be offered at competitive prices. Oranges will need to be shipped from India so as to reach Denmark by the beginning of May. Import duty on oranges during this period is minimal, at 5% ad valorem.

Lemons. Average annual imports of lemons are reckoned at 5,000 tonnes, mainly coming from Sicily and Italy; small quantities are also imported from Israel. These countries quote a cif rate of about $ 2 per carton of 19 kg in the Danish market.

Considering that India has a large production base of limes and that they can substitute the thick skinned lemons, it would be worthwhile to explore the possibility of introducing this item in the Danish market. Trial consignments may be made to ascertain the consumer reaction before undertaking exports on a regular basis. A duty of 5% ad valorem is levied on the imports of lemons and limes.

Onions. Danish onion imports range between 6,000 and 7,000 tonnes per annum, UAR, Poland, Hungary, Italy and Netherlands currently supplying the bulk of the requirements. Spanish white onion variety of 50/60 calibre enjoys distinct popularity among households and the pungent pink variety bulbs are in demand for industrial purposes, the latter accounting for 10% of the total. Import prices of Spanish white onion variety during January 1968 were as follows:

Cif Prices of Onions in Denmark

Source of Supply	Weight	Cif Prices in $
Hungary	25 kg bag	2.05
Poland	25 kg bag	2.20
Spain	25 kg bag	1.40

The Survey revealed that it should be possible for India to export pink varieties of onions in the initial stages as we grow a small quantity of white onion variety, provided the prices are in the neighbourhood of $ 65 per tonne. It would, however, be necessary for the onions to be properly dried and packed in 25 kg string bags. Onions in Denmark attract an ad valorem duty of 20%.

B. Processed Fruits and Vegetables

India's Trade. Exports of processed fruits and vegetables from India have been negligible, having risen from 27 tonnes in 1965-66 to 31 tonnes in 1966-67. Mango pickles and chutneys constitute the leading items, representing over 80% of the total exports during 1966-67.

Prospects. The Survey revealed that sizable sales could be built up in Denmark for pineapple products, mandarin orange segments, citrus concentrates, tomato concentrates, pickles and chutneys and mango products.

Pickles and chutneys, mainly of tropical varieties, have been showing adequate growth potential in the recent past reflecting reasonable prospects for products with acceptable quality and competitive prices. Trade believes that pineapples and mandarin orange segments have the highest growth potential among the processed fruits currently imported into the market.

Indian samples of mango slices and pineapple slices were tested by some of the major Danish import houses including FDB and UNIL, the principal wholesale buying organisations. While pineapple slices were found to be of acceptable quality, certain modifications were suggested in respect of mango slices. It was understood during the Survey that FDB had tried to sell mango slices in its stores a few years ago, the marketing experience having been disappointing resulting in considerable loss to the organisation. It appears that the mango slices exported to FDB were inferior in quality, fruit having lacked consistency.

Most of the organisations to whom samples of Indian pineapple slices were shown indicated their willingness to secure trial consignments from India. Denmark is a price motivated market for pineapple products, Mainland China quotations being 20-30% lower than those from USA and Taiwan. China's cif price for pineapple slices was about $ 0.24 per kg as against $ 0.28 per kg of USA during

February 1968. Should India be in a position to offer pineapple slices at a cif rate of $ 5.50 (24x2½), there appears to be adequate scope for the sale of Indian items in the Danish market.

The prospects existing for mandarin orange segments, citrus concentrates and tomato concentrates will depend on India's ability to produce the acceptable product at reasonable prices in the years to come. Immediate potential, however, exists for the items mentioned above and the following suggestions are made with a view to expanding trade with Denmark:

1. Pineapple slices, as indicated earlier, are sold in the Danish market largely on the basis of price. Trade discussions indicated that it should be possible to sell a minimum of 500 tonnes of pineapple products in Denmark initially provided competitive prices are offered. Typhone brand of pineapple slices from Taiwan sells at a cif rate of $ 5.75 per carton of 24 x 20 oz and Heaven Temple brand of Mainland China for a similar pack was quoted at $ 5.20. It was suggested that the Indian pineapples (24 x A2½) should be quoted at a cif price of $ 5.50. Interest was also shown in securing pineapple slices in No. 2 cans.

2. Though prospects for single strength juices in Denmark are limited, small quantities of orange juices in 20 oz cans could be sold. Orange juice from India was found to be acceptable and it was remarked that Indian sample has really a good orange flavour and the right yellow colour. Danes, however, prefer unsweetened orange juice in No. 2 cans. JAFFA Gold from Israel, which is the major brand in Denmark, is supplied at the rate of $ 1.39 per 12 cans of 20 oz (cif Copenhagen), a deduction of 5% as commission being allowed on this price.

3. On the basis of tests undertaken by some of the import houses, it is believed that limited demand can be built up for mango slices with some promotional support in the initial stages. The product was considered too soft and excessively sweet for the Danish taste. A number of wholesale organisations however were keen to place trial orders for distribution among selected retail outlets in Copenhagen for assessing the consumers reaction to the product. The possibility of making the slices less soft needs investigation.

4. Denmark is basically a concentrated juice market, there being adequate production of single strength juices in the country. CORO, a leading juice processing firm in Denmark with a modern plant, exports sizable quantities of juices to UK and West Asian markets. The industrial users in Denmark prefer the juice to be of highly concentrated form, 60° brix or more, juices below this specification being subject to 18% ad valorem import duty. Total imports of CORO are reported to be of the order of 1,000 tonnes of orange juices (65° brix), 200 tonnes of lemon juice (45° brix) and 350 tonnes of mandarin juice (65° brix). They showed interest in importing concentrated juice from India. Present suppliers include Brazil, USA and Italy with the following prices:

Concentrated Orange Juice 65° brix

Brazil	$ 210 per US gallon
USA	$ 262 per US gallon

Concentrated Lemon Juice 45° brix

Italy	$ 106 per US gallon

Concentrated Mandarin Juice 65° brix

Italy	$ 2 per US gallon

The concentrated juices are imported by the industrial users mostly in steel drums of 200 to 250 kg.

5. Discussions with an agent handling Indian pickles and chutneys revealed that though the products are of acceptable quality, packaging and the presentation do not come up to the sophisticated standards of the consumers. Following points require to be borne in mind for expanding exports:

   i. bottles used for packaging pickles and chutneys look too primitive and are hand blown;

   ii. caps of the bottles are too hard in the middle thus rendering the opening too difficult;

   iii. labels are old fashioned; printing needs to be improved;

   iv. outer packing of the bottles is not up to the standard and it was reported that approximately 5% of the bottles get broken during the transit.

   The market for pickles and chutneys has been expanding and is likely to grow at a fast rate in future years. It is essential to use bottles of the standards of Sherwood pickles and chutneys of London, the brand leader in Danish market.

6. Sales promotion plays a very vital role in all the Scandinavian countries including Denmark. Australia is reported to have spent approximately £ 10,000 ($ 25,000) on efforts aimed at promotion of Australian processed fruits. Australia has made a successful penetration into the market mainly on the basis of aggressive promotional effort. Australian Kayabram brand has an annual budget of $ 12,000 for Danish market, administered through their agents UNIL S/A, Copenhagen. Taiwan, which has also come up to be an important contender for the Danish market for canned fruits and vegetables, reportedly spent $ 24,000 on sales promotion and publicity during 1966. It is thus apparent that sales promotion in Denmark is of vital importance for the successful introduction of Indian products.

2.10 IRAQ

Background

Iraq constitutes a small market for fresh as well as processed fruits and vegetables, total imports of fresh items having averaged 123,000 tonnes valued at $ 9.7 million during 1964-66. Chief items of import include apples and bananas among fruits and tomatoes, potatoes and beans among vegetables. Imports of processed fruits and vegetables rose from 10,405 tonnes in 1964 to 13,753 tonnes in 1966, tomato puree, jams and jellies, juices and canned vegetables being the main items. In terms of value, imports rose from $ 2.5 million in 1964 to $ 3.3 million in 1966, reflecting increased imports of tomato puree which accounted for as much as 91% of the total in 1966. This item is mainly supplied by Italy and Bulgaria with which Iraq maintains specific trade agreements.

A. Fresh Fruits and Vegetables

Prospects. India has not so far exported any appreciable quantities of fresh fruits and vegetables to the Iraqi market. The prospects existing for Indian products assessed during the Survey are discussed below:

Major fruits and vegetables, including apples, bananas and tomatoes, are imported mostly from Lebanon and Jordan, which enjoy the advantage of not only geographical promixity but also substantial tariff preferences. Bananas, current imports of which are in the neighbourhood of 7,000 tonnes, is a commodity of immediate interest to India, particularly considering that Lebanon and Jordan also supply the Dwarf Cavendish variety, in which India has been able to build up a limited export trade with other countries. Bananas from Jordan are currently available at about $ 100 per tonne, c.i.f. Baghdad, which is a difficult price for India, as it is. Added to this, imports from India would attract a duty of $ 42 per tonne, while those from Jordan are allowed free. This rules out the possibility of India entering the market, although some of the importers contacted during the course of the Survey evinced positive interest in obtaining supplies from India, unless the issue is taken up with Iraq at the governmental level and concessions in tariffs obtained through negotiations.

There are hardly any imports of mangoes into Iraq, although supplies could be obtained free of duty from UAR. The superiority of Indian mangoes is generally acknowledged in the trade circles, but no possibility of exports is envisaged, since imports from India would attract a prohibitive tariff of $ 280 per tonne. If, however, tariff concessions could be obtained as suggested above, there is scope for India to export limited quantities of mangoes to Iraq.

B. Processed Fruits and Vegetables

India's Trade. India's export of processed items to Iraq had shown considerable growth during 1961-62 and 1964-65 when Indian exports rose from 307 tonnes in 1961-62 to 358 tonnes in 1964-65. The exports, however, declined to the low level of 93 tonnes in 1967-68 due to the restrictive import policy of the Iraqi government in respect of finished pickles and chutneys from foreign sources. Major Indian items moving to Iraq include mango pickles and chutneys having accounted on the average for over 95% of the total trade of processed items during the past decade.

Prospects. Tomato puree is by far the largest item in the imports of processed fruits and vegetables into Iraq, accounting on an average for 85% of the total value. Bulk of the supplies are obtained from Italy and Bulgaria, with which Iraq has specific trade agreements. Important among other items are fruit and vegetable juices, pickles & chutneys and jams, jellies.

But the import policy of Iraq is highly restrictive, tariffs ranging from $ 60 per tonne in the case of apricot paste to as much as $ 840 per tonne in the case of mushrooms and truffles (see Vol. V, Chapter VII(m) for details). These restrictions are defended by government circles as a measure of protection to the local processing industry, which is not well developed yet. No serious prospects are envisaged for a non-Arab country like India, which has to face these tariffs in full. Notwithstanding, there appears to be a strictly limited scope for exporting canned mango slices and nectar and typically Indian canned vegetables like karela, parwal and tinda.

The Survey has revealed that considerable prospects lie in the field of mango pickles and chutneys. India is the largest supplier of these items to Iraq. Exports from India declined from 206 tonnes in 1965-66 to 93 tonnes in 1967-68, and a further decline is expected in view of the restrictive import policy followed by Iraq. One of the leading Indian brands of mango pickles and chutneys has become so popular over decades in the Iraqi market that many local processors are keen on entering into franchise agreement with this particular Indian party. Under this agreement, supplies of raw mango slices in brine would be procured from the Indian party, pickles and chutneys would be manufactured in Iraq under the formula to be provided by the Indian manufacturer and the product would be marketed under the Indian label. Iraqi processors are prepared to enter into long term contract with this particular Indian manufacturer, ensuring an acceptable royalty, but insist on exclusive rights being granted to them for export of the pickles and chutneys to the entire Arab region.

While official thinking in India does not favour exports of raw mango slices in brine, this issue merits favourable consideration as it stands on a different footing. On the one hand, it should be noted that India is not the only supplier of raw mango slices in brine, which could be obtained from countries like Pakistan as well. The advantage India enjoys by virtue of one of its brands being strongly entrenched in the market is something that should not be ignored. The possibility of exporting raw slices in brine rests on the fact that the rigid restrictions prevailing in respect of the finished products are not applicable to the same extent in the case of raw slices which will be regarded as raw material. Besides, with the full emergence of the Arab Common Market, which will be a reality in the next few years, India will have to face protective tariffs in all the Arab countries in course of time; this is a consideration well worth bearing in mind in this context.

2.11 KUWAIT

Background

Kuwait has been importing considerable quantities of fresh fruits and vegetables; total imports averaged 101,336 tonnes ($ 8.6 million) during 1965-66. Melons, citrus fruits, bananas, apples, tomatoes and onions comprise the main commodities of import. Lebanon is the chief supplier of fresh fruits and vegetables accounting for 36% of the total imports during the same period, followed by Jordan, Iran, India and Syria.

Imports of processed items have been of the order of 14,230 tonnes with a value of $ 4.95 million, fruit and vegetable juices, canned vegetables, tomato paste and preserved fruits being the major products. Principal suppliers include Italy, USA, UAR, UK, Australia and Mainland China.

A. Fresh Fruits and Vegetables

India's Trade. Exports of Indian fresh fruits and vegetables to Kuwait amounted to 6,248 tonnes ($ 522,523) during 1967-68 as against 6,474 tonnes in 1965-66. Principal items imported in 1967-68 included onions (3,642 tonnes), bananas (1,625 tonnes), mangoes (614 tonnes) and other vegetables (352 tonnes). Whereas mango exports jumped from 224 tonnes in 1965-66 to 614 tonnes in 1967-68, exports of bananas declined considerably, from 4,828 tonnes to 1,625 tonnes. Exports of bananas have been declining mainly on account of the lower price quotations being offered by Somalia, the major competitor in the market. It was also understood that Somalia offers the product in superior packages, each individual bunch being wrapped in paper bags. In respect of bananas, mangoes and onions India holds a share of about 60%, 90% and 20% of the market respectively in terms of quantity. Limited supplies of vegetables like peas, beans, aubergines, okra and karela are also effected to Kuwait.

Prospects. On account of geographical proximity, Kuwait offers adequate scope for the sale of different varieties of fruits and vegetables. Prospects available in the short-term are discussed below:

Bananas. India currently holds a share of 60% of the total annual banana market of 8,500 tonnes. Indian c.i.f. prices of $ 120 per tonne are roughly 20% higher than those of Somalia, which is a major competitor in the market. Both countries supply only Dwarf Cavendish variety; higher price paid for Indian bananas is attributable to the superior quality of Indian fruit. There appears to be adequate scope for increasing India's exports of bananas to Kuwait in the short-term provided (a) slight reduction is offered in prices so as to render them more competitive with those of Somalia and (b) greater care is taken to ensure safe transit during the voyage. It was reported during the Survey that Indian exporters neither apply any chemicals to prevent stem rot nor wrap individual bunches in paper bags as done by Somalia, with the result that about 20% of fruit arrives in damaged condition. While the Indian exporters do not allow any compensation for this, the Somalian exporters give 5% extra quantity for the damage in fruit, which is normally very minimal.

Mangoes. India accounts for virtually the entire imports of about 500 tonnes of mangoes into Kuwait. Bulk of the exports from India are effected by sea, while limited quantities are air-freighted. Usually the ship chartered for bananas carries mangoes also from India during the season. As lower temperatures are required for mangoes than the 55°F maintained for bananas, considerable proportion of mangoes goes waste during the voyage. Such wastages also reportedly occur even when mangoes are shipped by general cargo liners with special refrigerated chambers, as the only shipping line (non-Indian) that operates between the Gulf countries and India, it has been reported, does not pay adequate attention to handling and storage.

Exports, not only of mangoes but also of other fruits and vegetables, can be stepped up considerably if adequate transport facilities are provided. It is suggested that the Shipping Corporation of India acquire and ply regularly between Bombay and the Gulf countries a small boat of 1,000 tonnes capacity, of which 500 tonnes should be refrigerated cargo. This should be a fairly fast one, with a speed of, say, 16 to 18 knots, so that the distance can be covered within about 100 hours.

Another requirement essential for building up exports on a sustained basis is effective organisation. The success achieved in respect of bananas is attributable to the organised effort of the Gujarat and Jalgaon Cooperative Federations, justifying the granting of such exclusive rights in respect of mangoes too to these Federations, pending the establishment of the Fruits and Vegetables Corporation recommended in this Report.

Citrus. Citrus ranks first among the fruits imported into Kuwait. Out of the total imports of about 15,000 tonnes of citrus fruits, oranges and tangerines constitute over 85%, balance being represented by lemons. Lebanon holds a sway over the market supplying about 90% of its requirements. The fruits are transported by road, using ventilated trucks which take about 5 days to cover the distance. Lebanese prices of both oranges and lemons during March 1968 were around $ 100 per tonne (c.i.f.).

India does not grow Shamouti oranges at present, which is the principal variety exported by Lebanon, but the possibility of exporting Mosambis may be explored by sending trial shipments. Likewise, efforts should be made to ascertain whether the Indian limes, which are more juicy, will be acceptable as substitutes for lemons, for which a market of about 2,500 tonnes exists in Kuwait at present.

Onions. India currently holds a 20% share of the total market of about 11,000 tonnes. Iran is the major competitor, followed by Syria and Lebanon. Indian prices are in the range of $ 70-75 per tonne c.i.f., as against $ 50-55 per tonne of the competitors. Indian onions are by and large regarded as superior by virtue of their pungent taste, which explains the premium. Complaints were received during the course of the Survey that sometimes onions are not properly dried before shipment from India, resulting in sprouting of the bulbs within a few days of their reaching the destination. This aspect needs to be looked into as such lapses are bound to impair the prospects of India. If proper care is taken of the quality and more competitive prices are offered, India can hope to secure a larger share of the market.

Tomatoes. Jordan is the largest supplier of tomatoes to Kuwait, accounting for about 90% of the total imports, which registered a sharp rise from 6,656 tonnes to 11,134 tonnes between 1965 and 1966. Prices of Jordan during March 1968 were around $ 70 per tonne, c.i.f., which appear to be within the reach of India. India, however, has scarcely exported any tomatoes to Kuwait, although the market is fairly large, mainly because of lack of satisfactory transport facilities. Tomatoes like other fresh vegetables, from Jordan are transported mainly by trucks which take barely three days to reach Kuwait. If efficient transport facilities are provided, as suggested above, it is considered possible for India to secure a sizable share of the market.

Other Vegetables. Current annual imports of other vegetables, including potatoes, beans, peas, cauliflowers, cabbages, aubergines, okras etc., amount to over 25,000 tonnes. Roughly 80% of the supplies come from Jordan, Iran and Iraq. But in terms of value, Lebanon leads with a share of about 25%, as a considerable proportion of Lebanese supplies are sent by air, resulting in higher landed costs.

India exports limited quantities of 150-200 tonnes, mostly by air. Fresh vegetables imported by air are retailed at 300 fils ($ 0.84) a kg, including a margin of about 25% for the importer. Scope for increasing such exports appears rather limited. However, if a specific commodity rate for fresh fruits and vegetables, such as obtains between Bombay and Kuwait, could be secured for air consignments from Delhi to Kuwait, it is possible to increase our exports, as merchants in Kuwait are keen on importing from Delhi. Air India has recently started operating two flights a week which directly connect Kuwait with Delhi; this should give a fillip to air shipments of fresh fruits and vegetables to Kuwait. But it must be noted that India cannot hope to secure a sizable share of the market until facilities are created for efficient sea transportation.

B. Processed Fruits and Vegetables

India's Trade. India has been able to build up a substantial trade in respect of mango nectar, exports having amounted to 600 tonnes during 1967-68 which represented 50% of the total market for this product. In addition India supplies 50 tonnes of pickles and chutneys annually to Kuwait. Exports in these items have been showing impressive growth over the past few years and the available indications suggest the continuation of this trend. Outside these items, however, India's share in the imports of processed fruits and vegetables is negligible, limiting its share in overall imports of $ 5 million to a mere 4%.

Prospects. Prospects for India in respect of different products are discussed below.

Canned Fruits. Australia is the largest supplier of canned fruits to Kuwait accounting for about one-third of the total imports of about 1,500 tonnes. China (Mainland), USA, Malaysia and Singapore are important among other suppliers. Prices (c.i.f.) of popular brands of Australia ranged between $ 4 and $ 7 per case during March 1968. Canned pineapples from Malaysia were offered at as low as $ 4.20 per case (24x2½), c.i.f. Most Indian quotations for this product range upwards of $ 8. Obviously India cannot hope to enter this market unless the product can be offered at competitive prices.

In the short run, there is scope for increasing India's exports of canned mango slices, which presently amount to about 40 tonnes. That India has already become established as a major supplier of mango nectar is a favourable factor. Indian prices of $ 8-10 per case (24x2½) compare favourably with those of UAR which is the major competitor.

Fruit and Vegetable Juices. India has done well in building up exports of 600 tonnes for its mango nectar, claiming a share of nearly 50% of the market, which was developed initially by UAR five years ago. India has an edge over UAR in price; wholesale prices of Indian mango nectar are around $ 4.60 as against $ 5.18 per carton (48x6 oz) for the Egyptian Kaha' brand of mango nectar, although both are retailed at the same $ 0.14 per can. While the Indian nectars do generally compare well with those of Egyptian origion in terms of quality, particularly flavour, some 'fair weather' exporters from India are entering the market with cheap nectars (with too much of water content); this cannot but impair India's prospcts in this market. It is therefore necessary that more rigid standards of quality should be formulated in India and conformity of production to such standards ensured, in the interests of consolidating and strengthening India's position in this market.

The market for tomato juice is fairly large. Popular brands like Heinz, Libby's and Delmonte are offered in the range of $ 2.30 - 2.60 per case (48x6 oz). India can hope to secure a share of the market provided quality products are offered at competitive prices. Besides, Indian exporters should be in a position to supply the product in lithographed cans.

Tomato Paste. Kuwait offers a market of about 5,000 tonnes for tomato paste, Italy is the largest supplier, offering the product at about $ 370 per tonne. Once the tomato industry develops in India on the lines envisaged elsewhere in this Report, it should be possible for India to secure an appreciable share of this market in the medium term.

Canned Vegetables. There is a fairly large market of about 3,500 tonnes for canned vegetables, in which India has practically no share at present. Peas, beans and asparagus are popular among canned vegetables. Some of the ruling prices (March 1968) are indicated below:

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			$
Cow & Gate (UK)	Bread beans	24x10 oz	3.00
-do-	Garden peas	-do-	2.75
-do-	Processed peas	-do-	1.75

India can export appreciable quantities of canned vegetables to Kuwait, provided the quality is brought to acceptable standards and adequate publicity and promotion is done for the products.

2.12 BAHRAIN

Background

Bulk of Bahrain's requirements of fruits and vegetables, both processed and fresh are met through imports, local production being inadequate. Annual imports of fresh fruits were of the order of 15,000 tonnes valued at $ 2.4 million during 1964-66. Chief items of imports include bananas, onions, mangoes, oranges and potatoes, Lebanon, India, Iran and Australia being the major suppliers. Volume of imports of processed fruits and vegetables is limited to 2,000 tonnes, 20% of which is estimated to be re-exports.

A. Fresh Fruits and Vegetables

India's Trade. India supplies a wide range of fresh fruits and vegetables to Bahrain, most important among these being bananas, mangoes and onions. Total imports of fresh fruits and vegetables from India rose from 3,158 tonnes in 1965-66 to 4,025 tonnes in 1967-68. With the exception of bananas, all the items rose in importance, the highest rise having taken place in the case of onions and mangoes.

Prospects

Prospects for stepping up India's exports are discussed below:

Bananas. Exports of bananas from India to Bahrain rose from 1,060 tonnes in 1965-66 to 1,338 tonnes in 1966-67, Somalia being the other major supplier of this item. The observation made in the case of Kuwait regarding the desirability of packing individual bunches in paper bags, as done by Somalian exporters, applies equally in respect of exports to Bahrain. Indian prices, of $ 120 per tonne are reasonably competitive as against Somalia's $ 100 per tonne.

Mangoes. There is scarcely any competition for India in respect of mangoes and the survey revealed increasing possibilities of stepping up exports to this market. India's exports of mangoes to Banrain rose from 102 tonnes to 207 tonnes between 1965-66 and 1967-68; further expansion of exports is possible if efficient shipping services are made available. With the introduction of a fast and regular shipping service between India and the Gulf area, as recommended elsewhere in the Report, it should be possible for India to export increased quantities of fruits and vegetables to this market.

It should be mentioned, however, that a sizable quantity of shipments from India are currently effected by air. Bulk of the supplies from India now take place from Bombay, whereas some of the importers contacted evinced keen interest in importing fresh fruits and vegetables from Delhi. It was reported, however, that the Delhi Municipal Corporation imposes certain restrictions on the movement of fresh fruits and vegetables from Delhi. The Corporation should be persuaded to waive these restrictions in the case of exports, as the scope for increased exports appears to be appreciable if shipments are made from Delhi. The frequency of the direct flight between Delhi and Bahrain, coupled with the fact that a special commodity tariff in respect of air freight already exists for fresh fruits and vegetables between Delhi and Bahrain (unlike between Delhi and Kuwait), is a favourable factor in this context.

B. Processed Fruits and Vegetables

Prospects. Demand for processed fruits and vegetables in Bahrain is limited, major proportion of the requirements being supplied by countries like UK, Australia and South Africa. There does not appear to be much scope for India to increase its exports of mangoe pickles and chutneys, which account for the best part of India's exports of processed fruits and vegetables to Bahrain, having averaged 30 tonnes during the past two years.

A limited market could be developed for Indian mango slices and nectars if adequate promotional efforts are made. Efforts of Indian exporters to introduce typically Indian canned vegetables like tinda, karela and parwal have not met with much success, mainly because these vegetables are available in fresh form in adequate quantities from India during the season. The Survey has revealed, however, that there is appreciable scope for exports of popular items like baked beans in tomato sauce, processed peas, garden peas and orange squash. Selected c.i.f. prices obtaining at the time of the Survey (March 1968) were as follows:

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Product	Source	Pack	C.I.F. Price $
Baked Beans in Tomato Sauce	UK	48x6-oz	2.40
-do-	-do-	24x20-oz	2.64
Garden Peas	-do-	24x1-lb	1.96
Processed Peas	-do-	24x10-oz	1.08
-do-	-do-	24x15-oz	2.28
Orange juice	-do-	48x6-oz	3.14
-do-	Japan	48x6-oz	4.20
Orange Squash	UK	12x24-oz	2.40

Particularly in the case of squashes, Indian prices compare favourably. However, local importers have reported that the quality of Indian squashes is not satisfactory, especially in respect of clarification. It has also been reported that orders placed with a leading Indian manufacturer for supply of baked beans in tomato sauce have not materialised, although the prices quoted were found acceptable. This underlines the need of developing a sufficiently wide production base in the country which would ensure continuity of supplies.

2.13 HONG KONG

Background

Imports of fresh fruits and vegetables into Hong Kong averaged 468,900 tonnes during 1964-66 comprising 183,600 tonnes of fruits and 285,300 tonnes of vegetables, total value being $ 31.33 million. A sizable proportion comprising mainly fresh vegetables was re-exported accounting for 147,400 tonnes. Average imports of processed fruits and vegetables during the same period amounted to 59,900 tonnes ($ 16.57 million), consisting of 14,200 tonnes of processed fruits and 45,700 tonnes of processed vegetables. China is the largest supplier claiming a share of 75% in the imports of fresh fruits and vegetables and 42% of processed items.

A. Fresh Fruits and Vegetables

Prospects. India's stakes in the Hong Kong market are confined to limited quantities of pickles and chutneys, catering mainly to the local population of Indian origin. The Survey has revealed adequate possibilities for citrus and mangoes among fresh fruits and mango slices, pickles and chutneys among processed products.

Citrus, apples, pears, grapes and bananas are the most important fruits imported into Hong Kong. Bulk of the supplies come from China. Price is the main plank of China's success in this market, Chinese prices being far below those of other suppliers like USA, Australia and Taiwan. In the case of oranges, for instance, Chinese prices are as low as $ 70 as against $ 310 per tonne c.i.f. paid for US oranges. In spite of this price differential, USA claims a share of 35% as against 30% of China, in terms of quantity. This is attributable to the popularity of established varieties such as Washington Navel and Valencia Late available from USA. It would appear that there is a distinct possibility of exporting Mosambi and Malta from India which can be offered at considerably lower prices than those of USA. Acceptability of these fruits in the Hong Kong market may be ascertained through shipments on trial consignment basis.

Annual imports of mangoes which come mostly from Philippines are close to 3,000 tonnes at present. The average c.i.f. price of about $ 195 per tonne offered for mangoes from Philippines appears to be within the reach of India. The mango season in Philippines which extends from March to September, nearly coincides with the Indian season; but the quality reportedly is not up to the mark, particularly in that the flavour of Filipino mangoes is very weak. This points to the possibility of India entering this market with its superior varieties like Dussehri, Chausa and Langra.

In the long run, India should be in a position to undertake supplies of Valençia Late and Washington Navel varieties of oranges, once their commercial production has been initiated in the country.

B. Processed Fruits and Vegetables

Prospects. Prospects for Indian processed items in Hong Kong are detailed below:

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Canned fruits including pears, peaches, loghats and mandarin orange segments is a major item in the imports of processed products into Hong Kong, currently amounting to 4,200 tonnes per annum, valued at $ 1.4 million. China is the largest supplier, accounting for nearly 50% in terms of quantity. Prices offered by China are the lowest. Other major suppliers include USA, Taiwan, Australia and Philippines. Canned fruits like peaches, pears and apricots are offered by USA around $ 6 per standard case as against $ 4 of China.

Despite the popularity of mango as a fresh fruit, which is available for about half the year, mango as a canned fruit has not been introduced in this market as yet. That mangoes are not processed in Philippines on any appreciable scale is perhaps of significance in this context. The Survey has revealed that it will not be possible for India to gain a foothold in this market without having tie-up arrangements with leading importers and agents in Hong Kong. It has been further ascertained that leading importers, mostly Chinese and Europeans, are not much interested in handling Indian products, while local Indians are not active in this field.

Against this background, the best strategy would appear to be for the Indian Government to open a large departmental store in Hong Kong, where apart from fruits and vegetables, other commodities and products from India could also be profitably marketed. The Chinese Government for instance runs a number of such stores in Hong Kong for promoting its products. This is necessary because successful introduction of new products from India depends heavily on adequate publicity and promotion, which the departmental store should be in a position to carry out. While items that seem to have an immediate prospect are mango slices and mango nectar, it should be possible to promote others like peas, beans and typical Indian vegetables including karela and parwal. Apart from canned fruits and vegetables, there is also definite scope for exports of mango pulp for use in the manufacture of ice creams, ready-to-serve beverages, etc.

2.14 SINGAPORE

Background

Domestic production of fresh fruits and vegetables being limited, significant proportion of the country's requirements is met through imports. Total imports averaged 238,000 tonnes comprising 145,000 tonnes of fruits and 93,000 tonnes of vegetables during 1964-66, total value being $ 25.7 million. Major items of import include pineapples, oranges and mandarins, bananas, potatoes and onions, Mainland China being the leading supplier. A major proportion of the fruits and vegetables imported into the country particularly oranges and mandarins is re-exported to Malaysia.

Imports of processed fruits and vegetables averaged 71,000 tonnes comprising mainly canned pineapples, pineapple juice, tomato juice and different varieties of canned vegetables. Mention may be made that a major proportion of the canned pineapples imported from Malaysia are meant primarily for re-exports.

A. Fresh Fruits and Vegetables

India's Trade. India's total exports of horticultural produce rose from 11,121 tonnes in 1966-67 to 13,785 tonnes in 1967-68. With the exception of onions, where India holds 55% share of the market, India's stakes in the fresh fruit and vegetable market of Singapore are negligible. It is also understood that small quantities of mangoes have been moving to Singapore market, total annual exports being around 6 tonnes during 1966-68 period.

The Survey, however, revealed that adequate sales of various Indian items including Mosambi, malta, grapes, bananas, mangoes among fruits and cabbages, tomatoes and potatoes among vegetables could be built up. Specific prospects as revealed by the Survey are discussed below:

Citrus. Leaving pineapples aside, which are mainly imported for use by the canneries, oranges and mandarins constitute by far the largest item in the imports of fresh fruits and vegetables into Singapore, their total imports having risen from 26,129 tonnes in 1964 to 31,207 tonnes in 1966. Australia, Israel, Egypt, USA and Taiwan are the major suppliers of oranges; most of the mandarins come from China. The average c.i.f. prices for oranges from USA and Israel are close to $ 170 per tonne. The fruits are individually wrapped in tissue paper and packed in bruce boxes. It is worth mentioning that while US shipments are made under refrigeration, oranges from Israel arrive in ventilated boats.

Discussions with importers in Singapore, some of whom are of Indian origin, suggest that the Indian Mosambi and malta have a fair chance of acceptance in this market. If these fruits could be offered at competitive prices, there is scope for building up an appreciable export trade, but the prospects depend very much on efficient shipping facilities being provided between India and Singapore. Past experience of the Singapore importers with fruits like mangoes and mandarins has been very disappointing in this respect. The absence of a fast shipping service and the poor attention paid to handling and stacking were mentioned as the main drawbacks. The mandarin market, which is currently of the size of about 7,000 tonnes, holds out good prospects for India. Mandarins are in great demand especially at the time of the Chinese New Year in February and are usually in short supply at that time. The peak season for mandarins in India is October-January for Nagpur santras and December-January for Assam santras, but it should be possible to make adequate supplies available in February also. Importers in Singapore, particularly those of Indian origin, are favourably impressed with the quality of the Nagpur santras.

Grapes. Imports of grapes into Singapore averaged 2,200 tonnes during 1964-66; Spain is the largest supplier, followed by Australia and USA. The major Spanish varieties like Aledo, Regina and Rosetti are well established in the market. Shipments from all the major sources are made under refrigerated conditions. It is understood that these countries offer grapes in the range of $ 300-350 per tonne. While Spain exports grapes in barrels of 46 lbs (20 kg), Australia and USA despatch grapes in cardboard cartons containing 5 kg.

India does not grow these varieties at present. However, production of Anab-e-Shahi in the Hyderabad region has been very rapidly increasing during the past few years, and the recent trial shipment sent by the Andhra Pradesh Government has reportedly evoked a favourable response from the importers in Singapore. However, the packing adopted was not found to be satisfactory, resulting in considerable damage to the grapes. If efforts are made to improve packaging and offer a competitive price, there appears to be adequate scope for building up a sizable export trade in grapes with Singapore. It would, however, be necessary to provide refrigerated transport facilities for the shipment of grapes.

Mangoes. Imports of mangoes into Singapore are currently around 2,000 tonnes, and virtually the entire supplies emanate from Thailand. Thailand has a distinct advantage by virtue of its geographical proximity; apart from this, Thai mangoes are offered at very reasonable prices around $ 130 per tonne c.i.f., Singapore. The superiority of some of the Indian varieties like Alphonso, Dussehri and Langra is fairly well acknowledged in the trade circles in Singapore. Some of the importers, who are of Indian origin, do obtain limited quantities of about 20 tonnes a year, mainly for distribution among friends and relatives. Regular trade on a commercial basis could not be developed for lack of adequate transport facilities. Once this problem is solved, it should be possible for India to build up an appreciable trade in mangoes with Singapore. However, it should be noted that price will remain an important consideration. While a slight premium could be expected for the Indian mangoes for their superior quality, it is doubtful whether any serious trade could be developed at prices higher than $ 180 per tonne, c.i.f. Singapore.

Onions. Onions, potatoes, tomatoes and cabbages are the major items among the fresh vegetables imported into Singapore. Total imports of onions are around 20,000 tonnes a year of which India holds a dominant share of

60%. A significant development relates to the emergence of Mainland China as a major competitor to India in this field. Exports of China more than doubled from 3,546 tonnes in 1964 to 7,575 tonnes in 1966, mainly at the cost of Australia and Japan, whose market shares declined considerably over the period. The dominant share of India in this market is attributable primarily to the distinct consumer preference the Indian onions, particularly the red Nasik variety, enjoy in this market. This has helped India to maintain its position in this market, notwithstanding frequent complaints about under-weight in shipments and imperfect grading. China's success in this market is mainly due to the red variety closely akin to the Indian Nasik variety, it has successfully developed in recent years. However, this variety dœs not have the same pungency as the Indian variety, which explains the continued preference for the latter. Price is another major plank of China's success. Average c.i.f. price for onions imported from China is about $ 60 per tonne as against $ 100 per tonne paid for Indian onions; this gives an indication of the competition offered by China. Importers in Singapore are very favourably impressed with the grading of Chinese onions, and it will be in the interest of India to enforce the grading regulations more strictly.

Potatoes. Total imports of potatoes increased from 27,478 tonnes in 1964 to 35,000 tonnes in 1966. Here again, Mainland China has improved its share of the market very considerably from about 15% in 1964 to as much as 43% in 1966. Other major suppliers include Australia and Netherlands. The Dutch potatoes, particularly the Bentje

Clay soil variety, command a premium in the market; the average c.i.f. price for imports from Netherlands is about $ 95 per tonne, as against which supplies from China and Australia are available at $ 75 per tonne. There are no serious prospects for India at the moment, but efforts should be made in India to develop production of varieties similar to the Dutch ones. The consumer preference in Singapore is for potatoes with yellow flesh beneath the skin; varieties currently available in India have white flesh, and their keeping quality is not good.

Cabbages. Imports of cabbages showed a substantial rise from 11,248 tonnes in 1964 to 16,557 tonnes in 1966; China is the largest supplier, accounting for 72% of the total imports in 1966; Taiwan accounts for bulk of the balance. Consumers in Singapore would prefer weighty cabbages with the layers closely clinging to one another; this characteristic, incidentally, ensures safety in transit. Cabbages currently available in India are too light and the layers tend to come during transit. India can secure a share of this market, if cabbages of suitable varieties are produced and competitive prices of $ 70 per tonne c.i.f. offered.

B. Processed Fruits and Vegetables

Prospects. Indian exports of processed items comprising chiefly pickles and chutneys and canned vegetables rose from 42 tonnes in 1966-67 ($ 22,133) to 52 tonnes ($ 25,466) in 1967-68. Outside this item, India's stakes in this market are negligible. The Survey, however, indicated adequate prospects existing for the exports of canned pineapples, juice concentrates and typically Indian canned vegetables like tinda, parwal and karela and popular canned vegetables like peas and beans. Specific prospects available for these items are discussed below:

Canned Fruits. Canned pineapples are the largest item in the imports of processed fruits and vegetables into Singapore, but these are meant primarily for re-exports. Imports of canned fruits in syrup (other than pineapples) increased from 1,923 tonnes in 1964 to 2,447 tonnes in 1966, China being the chief supplier of canned fruits in Singapore, followed by Australia and USA. Major canned fruits imported include peaches, pears, apricots and cherries. Despite the fact that mango as a fresh fruit is fairly popular in Singapore, efforts of some Indian exporters to enter this market with canned mango slices have not proved successful. However, by entering into tie-up agreements with leading importers and agents, who could be depended upon to carry out the requisite promotion and publicity, it should be possible for India to export appreciable quantities of canned mango slices to Singapore.

Juices. Imports of juice concentrates registered a substantial rise from 82,100 gallons in 1964 to 150,000 gallons in 1966, USA being the largest supplier, followed by Australia and UK. Imports of diluted juices also evinced an impressive rise from 129,300 gallons in 1964 to 182,100 gallons in 1966. Bulk of the increased demand was met by Israel, whose exports to this market jumped from 10,800 gallons to 64,600 gallons over this period, representing 35% of the total imports in 1966. Imports from China also rose rapidly during the corresponding period, from 2,000 gallons to 12,700 gallons. While there was a rise in imports from India, mostly of mango nectar, from 800 gallons in 1964 to 2,000 gallons in 1966, its share in the market is nominal. The Survey has revealed that there are definite possibilities of stepping up exports of mango nectar to this market, provided adequate publicity and promotion are carried out. In the long term, it should be possible for India to secure a sizable share of the growing market for juice concentrates, once the Indian processing industry is set on modern lines.

The Survey has revealed the scope for exporting mango pulp to Singapore for the manufacture of jams. Hot sterilized mango pulp in 5 kg tins would be acceptable to the processors. One of the leading processors also showed interest in obtaining supplies of guava and melon pulps from India. This information has since been transmitted to the Indian trade.

Canned Vegetables. Canned vegetables represent a major item, total imports averaging 4,500 tonnes during 1964-66. Beans, peas, carrots, artichokes, spinach and asparagus are some of the major import items in the market. UK and China are the leading suppliers of canned vegetables to Singapore, accounting for 30% and 26% respectively of the total market in 1966. Others include Thailand, Taiwan, Australia and USA. Apart from the fact that India could hope to secure a share of the market in respect of peas and beans, which are imported in large quantities at average c.i.f. rate of $ 3 (24x1 lb), a limited market could be created for some of the typically Indian vegetables like karela and parwal. As mentioned earlier, prospects in all these cases would depend very much on securing the services of a suitable agent in the market and carrying out adequate publicity and promotion. One of the leading importers has evinced considerable interest in handling Indian products on an exclusive basis for Singapore, Malaysia, Thailand and Hong Kong. This information has already been passed to the Indian trade.

2.15 MALAYSIA

Background

Average imports of fruits and vegetables into Malaysia amounted to 109,000 tonnes which are more or less evened out by exports of 111,000 tonnes during 1965-66. Imports comprising mainly oranges & mandarins, apples and pears among fruits, and onions, potatoes and cabbages among vegetables were valued at $ 18.1 million during the same period.

Malaysia is one of the largest exporters of canned pineapples to the world markets; its imports averaging 18,000 tonnes (5.1 million) over the period do not constitute an important segment of its foreign trade in horticultural products. However, small quantities of juices and canned fruits are imported principally from UK, USA, Hong Kong and Mainland China.

A. Fresh Fruits and Vegetables

India's exports to Malaysia, amounted to 17,661 tonnes in 1967-68 as against 29,550 tonnes in 1965-66, onions having accounted for over 99% of the total. The decline is only apparent, as the figure for 1965 includes exports to Singapore also, which was not shown separately in trade statistics. In fact, if Singapore and Malaysia are taken together exports amount to 31,200 tonnes in 1967-68 as against 29,550 tonnes in 1965-66. Total exports of onions to Singapore and Malaysia together during 1967-68, for instance, were placed at 31,200 tonnes thus indicating that the decline in exports was merely on account of the re-classification of export statistics in respect of Malaysia and Singapore. Outside onions, India's exports are almost negligible with the exception of certain trial consignments of grapes and oranges having been sent during 1966-67.

Oranges and Mandarins. Oranges and mandarins constitute by far the largest item in the horticultural imports of Malaysia. Total imports of these fruits increased from 10,428 tonnes in 1965 to 12,188 tonnes in 1966. Australia is the chief supplier, claiming a share of 28% of the market in 1966, followed by China, Israel, Taiwan and USA. Discussions with prospective importers have revealed the scope for the sale of Indian Mosambi and Malta. Indications are that these fruits could be offered at competitive prices of about $ 250 per tonne cif, but the prospects depend heavily on India's ability to provide efficient shipping facilities.

Grapes. Average annual imports of grapes into Malaysia are close to 1,200 tonnes currently supplied by Spain, Australia and USA. The recent trial consignments sent by Andhra Pradesh Government revealed that there could be adequate scope for the sale of Indian variety, Anab-e-Shahi. However, the type of cartons used was found to be inadequate resulting in considerable damage during transit. The Survey revealed that different suppliers use different packaging media. For instance, Spain exports grapes in barrels of 46 lb (20 kg) and 23 lb (10 kg), whereas Australia and USA use cardboard cartons of 5 kg. It is understood these countries offer grapes in the range of $ 300-350 per tonne. Should India be in a position to improve packaging and offer a competitive price, there appears to be scope for building up sales of this variety in Malaysia. It would, however, be necessary to provide refrigerated transport facilities.

Mangoes. Imports of mangoes, which are almost exclusively obtained from Thailand, are in the neighbourhood of 600 tonnes per annum. There is good scope for India to ship appreciable quantities of mangoes to this market, if satisfactory transport facilities are provided. Thai mangoes are quoted at a c.i.f. rate of $ 130 per tonne. Indian prices should be reasonably competitive allowing for a premium of 15 to 20%.

Onions. Onions represent the only item where India holds a dominant share of the market. Of the total imports of over 28,000 tonnes during 1965-66, India accounted for about 75%, the balance coming mostly from Mainland China. Although China has been successful in developing a strain very similar to the Indian Nasik variety, which enjoys a distinct consumer preference in Malaysia, it does not have the same pungency. Trade circles feel that once China succeeds in evolving a similar variety with equal pungency, India might lose the ground heavily. As it is, Chinese prices at about $ 60 per tonne c.i.f. are much lower than the average price $ 100 offered by India. Besides, Indian grading leaves much to be desired in comparison with the Chinese grading which is perfect. It will therefore be in the interest of India to enforce the grading regulations more strictly than at present.

Cabbages. Cabbages are important among other vegetables, current annual imports being over 6,600 tonnes; more than 90% of the supplies come from China. India can hope to gain a foothold in the market for cabbages if satisfactory transport facilities become available and if competitive prices of $ 70 per tonne c.i.f. are offered.

B. Processed Fruits and Vegetables

India's Trade. India's exports of processed items mainly comprising pickles and chutneys, hardly accounted for 46 tonnes in 1965-66, 73 tonnes in 1966-67 and 10 tonnes in 1967-68. The steep fall in 1967-68 is mainly attributable to the production difficulties faced by a leading Indian supplier during the year. Outside pickles and chutneys, India's exports to Malaysian market have been negligible.

Prospects. Besides stepping up the exports of mango pickles and chutneys, mango products appear to show adequate scope in the short-term.

Canned Fruits. Mango as a fresh fruit being fairly popular in Malaysia, there is a possibility of exporting sizable quantities of canned mango slices, but this requires considerable publicity and promotion.

Juices. The Survey revealed that long-term prospects exist for the sale of juice concentrates of Indian origin in Malaysian market. Total imports of juice concentrates rose from 53,400 gallons in 1965 to 89,200 gallons in 1966. USA and Australia are the leading suppliers, having accounted for 62% and 23% respectively of the total market in 1966. Bulk of the imports comprise citrus concentrates. India could hope to secure a share of the market once the processing industry in the country is set on modern lines and the manufacture of fruit and vegetable concentrates is taken up on a large scale.

Canned Vegetables. The current market for canned vegetables is about 4,600 tonnes, UK being the largest supplier, followed by Mainland China and New Zealand. India can hope to secure a share of popular vegetables like peas and beans at about $ 3 per case (24x1 lb) c.i.f. Considering that there is a large population of Indian origin residing in Malaysia, there is also a possibility of selling limited quantities of Indian varieties of canned vegetables like karela and parwal.

Imports of diluted fruit and vegetable juices averaged 60,000 gallons during 1965-66; Japan, China and USA are the leading suppliers. There is a definite possibility of establishing trade in mango nectar of 6 oz size, but the success would depend on adequate publicity and promotion.

Discussions with importers in Malaysia have revealed that unless tie-up arrangements are made with leading importers and agents, no serious prospects could be expected for the Indian products. Considerable publicity and promotion would be required for the Indian products which will be relatively new in the market. Indian exporters should be in a position to make available adequate funds for the purpose, and the agents selected should be such as could be relied upon to carry out the requisite publicity in an effective manner.

STRATEGY FOR HORTICULTURAL DEVELOPMENT AND EXPORTS

3. STRATEGY FOR HORTICULTURAL DEVELOPMENT AND EXPORTS

The world markets offer a vast potential for exports of fresh and processed fruits and vegetables. The exploitation of this export potential will necessarily be dependent on an expanded base of domestic production for deriving the advantages of economies of scale and cost reduction. India as a relatively new entrant in the world trade in horticultural commodities and products, which is so highly organised and intensely competitive, will have to face several problems in fields of production, transportation, marketing and sales promotion.

Problems of production cover a wide area including availability of suitable varieties of fruits and vegetables in adequate quantities and at competitive costs, methods of cultivation & harvesting, grading & packing and horticultural research & technology. On the processing side, dearth of vital raw materials like tinplate and sugar poses a problem. Problems of marketing mainly centre around the need of getting the right products across to the buyers overseas, according to acceptable specifications and quality standards, at the appropriate point of time, at competitive prices and through effective channels of distribution. Provision of adequate and efficient transportation and refrigeration facilities, both inside the country and during the voyage, investment in modern machinery & equipment and adequate resources for promotion & publicity are some of the basic problems to which careful attention needs to be devoted for exporting fruits and vegetables on a sustained but rapidly multiplying basis.

Considering the limited experience of India in the field of horticultural exports and against the background of the highly organised competition offered by the major supplying countries, it is imperative that an appropriate institutional set-up should be brought into being and a carefully formulated strategy evolved to make the export effort possible. An attempt has been made to outline solutions to some of these problems which are discussed in the subsequent sections.

3.1 PRODUCTION

Varieties. Availability of suitable varieties of fruits and vegetables is obviously the first prerequisite for developing export trade in fruits and vegetables. While India produces some 20 million tonnes of fruits and vegetablos, the quantities suitable for exports are very limited. This is indeed a poor reflection of the large resource base available in the country, but at the same time serves to underline the inadequate awareness of and the poor attention paid to the export potential offered by this sector of the national economy. For instance, in respect of bananas, which represent the largest single item of world exports of fruits, India does not grow Cavendish varieties like Giant Cavendish, Lacatan and Valery which account for the bulk of world demand. Taking citrus, which is the second largest item in the world fruit exports, India figures nowhere in international trade despite its fairly large production of about 2.5 million tonnes. The established varieties of oranges like Valencia Late, Washington Navel and Shamouti and mandarins like Satsuma (for canning purposes) are not cultivated in India on any appreciable scale. It has been reported that Washington Navel is being tried on an experimental scale in Coorg, but its performance has yet to be assessed. The dry regions of the Indo-Gangetic belt have been reported to be ecologically ideal for the renowned seedless Shamouti (Jaffa), but no efforts seem to have been made to grow this variety on a commercial basis in this country. In the case of apples, while a large number of varieties are grown in the country, no attempt seems to have been made to isolate the strains akin to varieties like Jonathan, Cleopatra and Starkley which are at present dominating the world trade. International trade in table grapes is dominated by varieties such as Alphonso Lavelle, Regina, Rosetti, Aledo and Smerdevka. But these are not yet cultivated in India. Varieties of melons such as Honey Dew, Ogen and Charentaias preferred in European markets are not commercially produced in the country.

It is no doubt true that India is a major producer and exporter of onions. But even in this case, there is hardly any production of white onions of the Spanish type, for which considerable demand is known to exist in the West European countries. Although some 500,000 tonnes of tomatoes are produced in the country, there are hardly any varieties suitable for exports. It is known that in spite of Europe being a leading producer of tomatoes, considerable off-season advantage exists for round varieties like Manmande, Plate de Chateaurenard and Saint Pierre, which are not grown in India at present.

Problem of securing suitable varieties is of significance in the processing sector. For example, it is not possible for India to enter the vast market that exists for canned peaches without undertaking production of clingstone peaches (Vivian, Everts, J.H. Hale etc.). As regards pineapples, which represent the second largest item in canned fruits exports, while the trend all over the world indicates a definite shift in favour of the Smooth Cayenne, no systematic effort has been made to study the suitability of this variety to Indian conditions or to develop a strain having the same desirable characteristics, from the point of view of the fresh trade as well as processing. Similarly, production of fresh tomatoes akin to established varieties such as San Marzano and Roma is necessary for taking up manufacture of canned peeled tomatoes and tomato concentrates, which are volume items in international markets. Apart from ensuring product acceptability, special processing varieties developed the world over in respect of different fruits and vegetables are usually associated with high yields, in processing as well as cultivation, thus making a significant contribution to reduction in production costs.

It follows from the foregoing example that it is of vital importance to develop the production of suitable varieties, adapted to local conditions, for building up an export oriented horticultural industry in the country. Varieties chosen should be vigorous in growth, high yielding (both in field and processing), resistant to pests and diseases and such as can withstand the hazards of long haulage. The Indian Council of Agricultural Research and State Horticultural departments together with the National Seeds Corporation, need to make vigorous efforts to evolve requisite varieties and take effective steps to extend their cultivation. The Survey has estimated the requirements of nurseries (bananas, pineapples, satsumas, and others) at Rs 15 million over the next five years.

Yields. By application of modern technology and scientific cultural practices, the major supplying countries of the world have been able to achieve high field yields and processing yields in respect of many fruits and vegetables. For instance, about 20 tonnes per hectare are obtained for Washington Navel in Spain as against which the yield per hectare corresponding to Mosambi in India is 10 tonnes. Though in the case of bananas, yields obtained in India are comparable to that of world average yields, attempts are yet to be made of realise high yields of 30 to 40 tonnes as in the case of Ecuador, Ivory Coast etc. In respect of pineapples, yields as high as 60 to 70 tonnes per hectare are obtained in countries like USA (Hawaii) and Philippines through modern methods of cultivation, while in India yield is only about 10 to 12 tonnes per hectare. Comparative yields per hectare in the case of onions are 32 tonnes in USA and 23 tonnes in Netherlands as against 9 tonnes in India. In the case of potatoes, as against 26 tonnes per hectare realised in Netherlands, the average yield in India is only 7 tonnes By choosing the right varieties and adopting advanced methods of cultivation, countries like USA, Italy and France have been able to achieve yields of 25 to 30 tonnes per hectare in the case of tomatoes, while the yield in India is no more than 10 tonnes. (Annexure D)

It is necessary to launch upon a vigorous drive for raising the general level of field yields of major crops in demand in the overseas markets to withstand competition from world's leading suppliers. The Survey emphasises the need for stepping up the current yield of pineapples, among others, from 15 tonnes per hectare to 45 tonnes by 1975, bananas from 25 tonnes to 30 tonnes strawberries from 15 tonnes to 25 tonnes, apples from 7 tonnes to 15 tonnes, onions from 9 tonnes to 20 tonnes, tomatoes from 10 tonnes to 25 tonnes and potatoes from 7 tonnes to 15 tonnes. Besides, it envisages commercial production of mandarin oranges yielding 15 tonnes by 1975.

The yield obtained in processing has a vital bearing on the cost of processed products. Great attention is therefore being paid in other countries to raising processing yields, through developing suitable strains and bringing about requisite modifications in existing varieties through appropriate growth regulators. For instance, following the success of Japan in the export trade of canned mandarin orange segments, other countries like Spain and USA are increasingly tending towards the cultivation of similar seedless strains, so as to realize higher processing yields. Leading pineapple canners in countries like USA (Hawaii) and Philippines pay constant attention to regulating the size of the fresh fruit so as to ensure maximum processing yields. As a result high processing yields of over 50% are obtained by these canners, as against which the yield in India is only about 40%.

In the canning of Nagpur Santras, undertaken to a limited extent in India at present, not only the processing yield is low because of the seeds, but considerable wastage occurs in the form of broken segments in the process of deseeding.

Cultural Practices. While it is no doubt true that high yielding varieties are specially developed, cultural practices employed are equally important, if not more, from the point of view of not only yields but also quality. Major improvements have been made in the advanced countries in the methods of cultivation in the field of horticulture. For instance, in the case of pineapples, average yields in Philippines are very low being in the range of 10-12 tonnes per hectare; however, yields in the canners' estates are among the highest in the world, averaging about 65 tonnes per hectare. The vast disparity in yields, although the same variety (Smooth Cayenne) is used, is attributable to the intensive and modern methods of cultivation adopted by the canners. Canners in Philippines have been able to regulate the size of the fruit by the system of close-bed planting, which is, in addition, an essential factor contributing to higher yields of the crop. As many as 65,000 plants are planted per hectare in Philippines as against 9,000 in India. Further, through application of suitable hormones, availability of the fruit round the year is ensured; this is true not only of Philippines but all other major producers of pineapples.

Interplanting and rotation of crops represent two major factors deserving careful consideration in raising fruit and vegetable crops. Inter-cropping, which helps realize maximum returns from the available land resources, is fairly common in the major supplying countries. For instance, bulk of the production of bananas in Lebanon comes from citrus orchards, where bananas are planted in between the citrus trees; four to five harvests of bananas are realized before the citrus trees enter the fruit bearing stage, when the banana crop is discontinued. Inter-cropping of bananas with avocados in Israel and winter onions with cotton in UAR may be cited as other instances. Suitable rotation of crops is necessary to ensure realization of maximum yields. Related crops tend to make similar demands on the soil for nutrition and become susceptible to similar pests and diseases. For instance, tomatoes representing a most demanding crop nutritionally, it is considered advisable to rotate tomatoes with less demanding crops like cereals.

Research undertaken on a continual basis to ascertain the optimum spacing of plants, irrigation requirements, composition and dosage of fertilizers, pesticides and insecticides to be applied etc. has paid rich dividends in the advanced countries. The Indian Council of Agricultural Research should intensify its efforts to bring about improvements in the methods of horticultural cultivation, so as to step up yields and ensure quality of the produce.

Methods of Harvesting. The right time of harvesting is of extreme importance in determining the keeping quality and transportability of the fruit. In case the fruit is picked too early, it tends to shrivel up and lack proper aroma and taste. On the other hand, a crop picked too late could retain good colour but may decay quickly without even entering the marketing system. Specific maturity standards have therefore been set for picking and harvesting of fruits and vegetables in major supplying countries on the basis of scientific investigation. Banana is a case in point.

Further, efforts are continually being made in the advanced countries to introduce mechanical harvesting wherever possible. For instance, the palmetta'* system originally developed by Italy for peaches, which has been devised to regulate the growth of the tree so as to facilitate efficient harvesting of the fruit, is becoming increasingly popular with other peach producing countries, and is being extended to other fruits like pears and apricots. Mechanical harvesting of tomatoes, which essentially contributed to the revival of the Californian tomato industry cutting the harvesting costs by 50%, is gaining increasing importance. Tree shakers and catching frames are being successfully utilised in USA for harvesting apples, tart cherries, plums and prunes. Though these labour-saving devices are not of immediate relevance to the Indian circumstances where the wage rates are relatively not high, they should be kept in view to bring about improvement in the harvesting methods from time to time.

Procurement. Structural changes in the fruit and vegetable marketing system have brought in their wake a new complexity in the methods of procurement. The old order - from a small individual farmer through the itinerant merchant through the terminal market to wholesaler/exporter - no longer prevails in many of the supplying countries. Instead, the farmer directly sells to co-operatives, corporate organisations or processors under contractual obligations. This has led to a healthy integration of production, procurement and marketing resulting in large scale operations concentrated in fewer hands.

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*'Palmetta' system consists of training peach branches on steelwires, stretched horizontally and supported by a central leader.

For instance, the SICAs in France, which are specialised growers' co-operative production and marketing societies, are very active in the fruits and vegetables sector. These societies have proved very effective in the marketing of fresh produce within the country, though their success on the export front is limited as yet. The fruit and vegetable marketing co-operatives are very active in USA. These cooperatives, numbering some 650, have a net volume of business in excess of one billion dollars. Producers' marketing co-operatives in UK, currently handling horticultural produce worth over $ 25 million a year, are expected to play an increasingly important role in the years to come. A number of these co-operatives have central facilities for grading, packing and storing; and demand from retailers, especially supermarkets and chain stores, for produce of uniform quality and presentation is constantly on the rise.

The system of contracts between producers and processors is firmly established in all the major supplying countries: an estimated 70% of the total area under vegetables for processing is covered by contracts in USA and about 60% of the raw material requirements of processors in Southern France are procured through contracts with growers. Contracts are beneficial alike to the producers and processors in that while the producer is assured of an outlet for his produce, the processor has the guarantee of adequate raw material supplies. Apart from price, in terms of either specific commitments or the method of computing price, most contracts contain provisions relating to variety, grade, seeds and fertilizers to be used, cultural practices to be adopted, technical advice, inspection, financing etc. It should be mentioned, however, that contract specifications vary considerably, depending upon the nature of the crop. For instance, field supervision does not figure so prominently in the case of tomatoes as in the case of green peas. Instances of similar contracts in India are few.

Having regard to the small size of holdings in India and considering that export entrepreneurship is by and large absent, it is necessary to encourage growers to form into co-operatives, which should be affiliated to a central organisations, such as the proposed Banana Development and Export Corporation and Fruits and Vegetables Export Corporation which will be discussed later. This Corporation should select areas particularly suitable for different fruit and vegetable crops and enter into workable arrangements with the co-operatives for regular supply of requisite volume of acceptable quality. The Corporation should undertake the responsibility of supplying inputs, extending technical guidance on the necessary cultural practices to be adopted, providing adequate financial assistance, and assure the growers of a minimum acceptable price for the produce. This would mean that the growers would deliver the entire production of fruits and vegetables at packing houses, which the Corporation should set up and run in the midst of growing areas. While the primary objective of the Corporation will be to channel the production to the export markets, the Corporation will have to assume responsibility for disposing off in the domestic market that part of the production which does not measure up to export standards.

Considering that higher yields will be obtained as a result of the advanced methods of cultivation that will be possible under the aegis of the Corporations and that the element represented by middlemen will be dispensed with as the Corporations will procure the produce directly from the growers, it is envisaged that it should be possible to effect exports on a viable basis. It is, however, necessary that the Corporations should be in a position to underwrite such losses as may be incurred in the initial stages. The Corporations will have to enter into tie-up arrangements with leading buying organizations in overseas markets for building up a steady export trade.

Ceiling on Land Holdings. In major supplying countries like USA, France, Italy and Spain, horticultural industry has come to be highly organized, characterized by large scale operations facilitating application of advanced techniques of production. The resultant improvements in yields as well as quality of the produce are of equal significance to the processing sector as to the fresh sector of the horticultural industry. While leading packers in some of the countries have evolved successful contractual arrangements with local growers, there are many instances where processors have their own farms and plantations for assured supplies of the requisite varieties of fresh fruits and vegetables.

This is particularly true of the pineapple processing industry, where in all major supplying countries, vertical integration of the entire range of operations, from cultivation of the fresh fruit to marketing of the finished product, has made material contribution to economies in production costs. For instance, field yields of pineapples realized by leading canners in Philippines are as high as 65-75 tonnes per hectare as against 15-18 tonnes elsewhere in the country, as these canners have the resources and incentive to devote the best possible attention to their own estates on which they depend exclusively for the fresh fruit. Pineapple canners in Malaysia in fact are statutorily required to own a minimum plantation of 1,500 acres (607 hectares) each, so as to ensure improvements in quality as well as yield of the fresh produce. Likewise, in Taiwan, pineapple canners are required to ensure that at least 30% of the requirements of fresh fruit are met from their own plantations.

It is obvious that for application of modern techniques of cultivation to become feasible, the holding should be of a minimum economic size. But the existing ceilings on the size of holdings, as embodied in the land reform acts of the different States and Union Territories, do present a problem in this context. Some of the processors within India have in fact complained of the obstacles posed by these ceilings in acquiring holdings of adequate size for cultivation. The genuineness of this problem can be appreciated when one takes into account the fact that individual efforts to forge direct links with growers have met only with limited success. This is of course understandable, considering that the processing industry in India represents but an inconsequential outlet yet for the fresh fruits and vegetables produced in the country.

In this context, the existing ceilings on agricultural holdings in different parts of the country may be reviewed briefly. The comprehensive land reform legislations brought out by various States and Union Territories are based mainly on considerations of the requirements of economic development on the one hand and social justice on the other. During the successive Plans, a ceiling of three family holdings has been proposed as a working guideline, where two basically different interpretations of the term 'family holding' are in vogue: one based on the concept of physical operations and the other on revenue. Ceilings adopted vary considerably from State to State and region to region within a given State, depending upon the quality of the land, irrigation facilities available, social conditions obtaining etc. Besides, there are two different aspects of ceiling, one relating to existing holdings and the other to future acquisitions. For instance, the ceiling on existing holdings varies from 12 acres of double crop paddy land in Kerala to 324 acres applicable to certain types of dry land in Andhra Pradesh. Ceiling limits prescribed for the existing and future holdings are the same, except in the case of Andhra Pradesh and Mysore, where lower limits have been proposed for future acquisitions at 18-26 acres and 18-144 acres (depending upon the quality of the land) respectively, which represent two-thirds of the ceiling applicable to existing holdings in both the States. While there are considerable variations in the ceiling on holdings from region to region, 25-30 acres of wet land represents the range applicable to most parts of the country (Annexure E)

However, certain exemptions are allowed in the various State acts in respect of certain types of holdings, plantation crops like tea, coffee and rubber and sugar-cane farms operated by sugar factories being exempted in most cases. As regards horticultural crops, while orchards are exempted from the land ceiling act in certain States, no such provision exists in respect of vegetable crops in any State. Even in the case of orchards, complete exemption is made only in the case of Andhra Pradesh, Himachal Pradesh, Jammu & Kashmir, Punjab (and Haryana), Rajasthan and West Bengal, the only provision, in some of these regions, being that the holding should comprise a reasonably compact area. In other States such as Uttar Pradesh and Madhya Pradesh, only orchards which had been in existence on or upto a specified date (in 1958/1959) prior to the enactment of the relevant legislation are entitled to exemption. In States like Kerala, the act includes a general provision to treat any special kind of crop on par with the plantation crops, at the discretion of the State Government. (Annexure F)

On the other hand, there are provisions in most State acts to exempt a) farms run by approved co-operative societies and b) land required in connection with the operations of any approved industrial undertaking. Depending on the discretion of the concerned State Government, it is perhaps possible, under these provisions, for progressive units to acquire adequate land for the purpose of cultivating the required fruit and vegetable crops. However, acquisition of adequate land exclusively for cultivation of the fresh crops, with the object of marketing such crops in the fresh form, seems to be possible, even under these provisions, only in the co-operative sector and not in the corporate sector.

In view of the complexities involved, it is recommended that a high-level conference should be convened, under the auspices of the Planning Commission, of senior representatives of Departments of Agriculture of the Centre and all States and Union Territories, to determine what additional measures, from legislation and other standpoints, need to be taken, in order to facilitate acquisition of holdings of adequate size, which, as made out above, represents an important prerequisite for building up a modern horticultural industry in the country.

3.2 GRADES, STANDARDS AND PACKING

Grades and Standards. Extensive improvements are necessary in respect of grading, standardization and packing of fruit and vegetable items in India. At present there is hardly any grading of fresh fruits and vegetables in the country according to accepted standards. The Directorate of Marketing and Inspection has evolved Agmark grade standards under the Agricultural

Produce (Grading and Packing) Act for selected fruits and vegetables including certain citrus fruits, apples, mangoes, William pears, chickoos, grapes, pineapples, onions and potatoes (table and seed), and has also initiated a scheme for grading facilities at the farmer level. Under the scheme, grading units are set up in regulated markets, cooperative societies and warehouses which are provided with the services of trained graders to assist the producers. However, the success achieved so far is very limited as is evidenced by the fact that in 1965-66 only 6,000 tonnes of vegetables were graded according to Agmark standards. Bulk of the vegetables graded comprise onions, exports of which are subject to compulsory grading and inspection. But judging from the complaints of importers of onions in Singapore and Malaysia, the grade standards and their implementation leave much to be desired.

Major producing and importing countries, however, are moving towards unified grades and standards in respect of marketing of fresh produce with a view to providing the consumer with requisite type, quality and disease-free fruits and vegetables.

The standards for the processed items in India are laid down in the Fruit Products Order 1955, under the Essential Commodities Act of 1955. The Fruit Products Order specifies measures for compulsory licensing of manufacture of fruit products under healthy conditions for the development of the industry. It lays down standards of hygenic maintenance for processing and for premises, for quality and composition (use of premissible ingredients like preservatives, colours etc.) of products and packing. The standards laid down, however, are minimum standards.

The quality of the canned fruits and vegetables produced in India, especially the items coming out of the large scale units, are reportedly of a high standard and, in general conform to the minimum standards laid down in the FPO. Laboratory tests conducted by CFTRI on imported pineapple slices, fruit cocktail, orange segments, and orange, lemon, pineapple and grapefruit juices confirm the view that Indian products are comparable to their counterparts in major supplying countries. (Annexure G). The problem in accelerating the exports of processed items therefore is one of raising the Indian standards to the level of those obtaining in the advanced countries. Rigorous quality control and inspection methods should also be instituted in respect of processed items so as to eliminate the exports of sub-standard goods.

The Indian Standards Institution has since recently been formulating comprehensive grades and standards for fruits and vegetables, fresh and processed. It is suggested that these standards should be made obligatory after ensuring that they conform to international standards.

Packing. The packing adopted for different fruits and vegetables in India is based more on custom than on considerations of functional efficiency. The Directorate of Marketing and Inspection has found in a recent survey that transit losses, between Poona and Madras, could be brought down from 10% to 7.4% in the case of mandarins by using bamboo baskets in place of gunny bags and 14.2% to 4.4% by replacing bamboo baskets with woodes boxes in the case of grapes. It is obvious, that methods of packing in India are still to develop on modern lines.

The type of packing to be adopted basically depends upon the nature of the commodity, mode of transport and the manner and period of storage. Apart from these considerations, specific practices followed in different markets represent a major factor to be taken into account. For instance, while packing of onions in gunny bags is quite acceptable in the South East Asian countries, there is a distinct preference for string bags in the West European markets. While individual market requirements should no doubt be kept in view, it is essential for India to be abreast of the developments in packing that are constantly taking place the world over. For instance, prepacking of fruits is now very common, most fruits being individually wrapped in tissue paper and placed in cartons. Cell packing has come to stay in the marketing of fruits like apples and pineapples and vegetables like aubergines. Tray packing is becoming increasingly popular in fruits and vegetables like apples, strawberries and capsicums. Bruce boxes are extensively used in exports of oranges, tangerines, clementines and grapefruits. OECD Standards reproduced in Volume V of the Report give an indication of the minute detail into which these standards go such as diameter of the fruit, juice, content and permissible greenness (as a proportion of the total surface). These standards enjoy wide acceptance in most importing countries. One of the fundamental prerequisites of expanding export trade in fresh fruits and vegetables therefore will be to formulate and ensure strict adherence to grade standards in conforming with internationally accepted standards.

As far as the fruit and vegetable processed items are concerned, each country has laid down vigorous statutory health regulations, both for local and imported products. Details of food and health regulations in relation to processed fruits and vegetables in the Survey countries are furnished in Chapter IV, Volume V of the Report. Major importing countries scrupulosly apply these health regulations and subject the imported products to vigorous quality control and inspection methods.

Under the auspices of WHO/FAO, a Joint Committee has been set up to evolve common and acceptable international standards for processed items with a view to bringing about a certain amount of uniformity in the quality, content, sanitary requirements, permissible additive substances and colours. Already agreed standards have been formulated for canned tomatoes, peaches, green beans, grapefruit, pineapple, green garden peas, mushrooms and asparagus.

Further, major supplying countries like Italy, Spain, France and Greece have modern facilities for undertaking scientific grading, handling and packing of fresh fruits and vegetables for meeting the exacting requirements of different world markets. Individual operations are getting increasingly incorporated into processing chains accomplishing all packing operations, inclusive of labelling and price marking on the individual packs. Such facilities are lacking in India.

It is recommended therefore that the Indian Institute of Packaging should, on the basis of a comparative study of the practices followed by major suppliers and keeping in view the packing standards brought out by the OECD (Volume V, Chapter II of the Report), evolve appropriate standards for exports of fresh fruits and vegetables from India. It is necessary that strict compliance be ensured with standards so evolved. For instance, standards evolved by the Israeli Institute of Packaging, which is constantly engaged in bringing about improvements in the methods of packing, are automatically made obligatory in the field of exports, the enforcing authority being the Institute itself.

Leading supplying countries have packing houses equipped on modern lines in centres of horticultural production so as to derive maximum locational advantages from the standpoint of the keeping quality of the produce, storage and warehousing. Detailed description relating to the structure and functions of packing stations are provided at (Annexure H). India has to make much headway in this field and packing houses have to be set up near the producing areas. The Survey therefore recommends the establishment of 10 modern packing houses in selected centres at an approximate cost of Rs 250,000 each. (Annexure I).

3.3 TRANSPORTATION AND WAREHOUSING

Lack of adequate transport facilities represents one of the major bottlenecks in the field of fruits and vegetables. This is in fact one of the major factors responsible for the estimated 25 to 30% wastage that occurs in the total output of fruits and vegetables in this country. Areas of concentrated horticultural production generally lying in the interior hinterlands, the need for efficient transportation to marketing centres and port towns is apparent. Where the distances involved are long it will become necessary to preserve the produce under refrigerated conditions depending upon the type of commodities transported.

Road and Rail Transport. The use of refrigerated trucks and air-cooled rail wagons is extensively witnessed in major supplying countries, both for internal movement of produce and for export to the neighbouring countries. European countries, for instance, have pooled their refrigerated and air-cooled wagons and have formed an inter-governmental organization 'International Frigorifique' (INTERFRIGO), to manage their operations efficiently. The main objective of the organisation relates to "the construction, hiring out and the operation of rolling stock and installations necessary for carrying out and development of international transport at controlled temperatures". It is concerned with all activities to obtain and maintain the most suitable temperature of perishables during their transportation from production to final delivery. Similarly, a pool of refrigerated trucks is operated by TRANSFRIGORTFIQUE EUROPE, with headquarters in Basel, for efficient movement of perishable produce between major commercial centres of Europe. Even for long distance voyage, it is reported that European exporters prefer refrigerated trucks to air-cooled or refrigerated wagons in view of their greater convenience, fixed rate per unit-load and quicker movement.

Considering the advantages that accrue from such pool arrangements arising out of collective carrier systems, it is recommended that the Indian Railways, in consultation with the proposed Banana Development and Export Corporation and the Fruits and Vegetables Export Corporation, should acquire adequate number of refrigerated/air-cooled wagons and organise a common pool for efficient movement of the fresh produce. The Survey proposes an investment of Rs 15 million for acquiring 20 refrigerated trucks and 50 air-cooled wagons during the next 5 years.

Shipping Facilities. The Survey has revealed that lack of adequate shipping facilities represents one of the major handicaps in the way of increased exports, particularly of fresh fruits and vegetables. For instance, the enthusiasm of importers (of Indian origin) in Singapore and Malaysia to obtain supplies on a regular basis of choice varieties of mangoes and other fruits and vegetables is dampened by the lack of adequate and efficient transport facilities. Past experience of these importers has been disappointing with considerable damages incurred in the transhipment of fruits like mangoes and mandarins; on a number of occasions the fruits arrived in an absolutely dry condition, devoid of any juice. Given proper attention to handling and stacking, it is in fact not necessary to transport most fruits and vegetables under refrigerated conditions to the nearby markets like Singapore, Malaysia and the Gulf States; properly ventilated chambers should serve the purpose adequately. It is noteworthy that oranges from Israel, which is considerably far away compared to India, are transported to Singapore and Malaysia only in ventilated boats.

Discussions with importers in Kuwait and Bahrain have confirmed that there is considerable scope for stepping up exports of a wide range of fresh fruits and vegetables, provided there is a fast and efficient shipping service between India and the Gulf States. It is estimated that with a moderately fast ship (16 to 18 knots), it should be possible to cover the distance within 100 hours; this in turn means that most fruits and vegetables can be shipped under ordinary ventilated conditions. It is suggested therefore that the Shipping Corporation of India should, in consultation with the proposed Corporations, acquire and ply fast moving ships with sufficient provision for refrigerated cargo. As far as the European ports are concerned, it would be advantageous to utilise the existing shipping services between Oceania and Europe for carrying Indian perishable cargo under refrigerated conditions.

Banana Boats. Major suppliers of bananas like Ecuador, Ivory Coast and Honduras ply their own banana boats equipped with horizontal cooling system, with capacities ranging from 2,000 to 5,000 tonnes and speeds between 16 and 21 knots and upward. Chartering of banana boats by leading exporting countries for one to two years is also a common feature. Chartering of such boats is vital for large scale expansion of India s exports of bananas.

Air Shipments. In recent years, fresh fruit and vegetable shipments by air have become fairly common. Air shipments of Californian fresh produce, for instance, totalled 14.2 million kg billing weight (10.7 million kg nett weight) during 1966. The Sea Bound World Airlines, which operates cargo planes, moved 500,000 kg of fruits and vegetables during the first six months of 1967. Israel has been airlifting on an average, 100-150 tonnes of avocados, strawberries, capsicums, anbergines and salad type vegetables daily to the European markets, particularly West Germany, UK and Switzerland, for the past two years. It is reported that Israel proposed to airlift annually $ 35 million worth of horticultural produce by 1970.

Increasing quantities of South African produce, particularly fresh fruits, are being transported to UK by aircraft instead of boat. In the first three months of the 1967 season, on the average about 7,500 cases of avocado pears per week were exported to UK. Among other important items air-shipped during the past few years, examples may be cited of tomatoes of Canary Islands to U.K, strawberries from Mexico to London, lettuce and celery from California to Scandinavia and peas from Italy to British and Continental centres.

It will be advantageous for India to follow the same strategy, especially with regard to mangoes, lychees, strawberries and grapes, capsicums, French beans and aubergines. However, considering the element of high cost of freight - $ 0.45 per kg to UK, which is almost equal to the acceptable c.i.f. price for mangoes - it will be necessary to offer adequate subsidy on freight, in the initial stages. The objective should be to create base markets for eventual expansion, when exports grow into sizeable volume and adequate refrigerated space coupled with regular shipping services becomes available. All air shipments of perishables to European markets, it should be borne in mind, should be palletized or packed in containers.

Warehousing and Cold Storage facilities. Rapid strides have been made in the development of cold storage in the advanced countries, greatly contributing to orderly marketing. Major supplying countries, as a rule ensure adequate provision of warehousing and cold storage facilities at the packing houses, assembling points, rail and road heads and loading and unloading ports and terminal markets.

In India, out of the total 600 cold stores, 405 units store only potatoes, accounting for about 85% of the total storage capacity of 682,000 tonnes. This is an indication of the scope that exists for extension of cold storage facilities for other vegetables and fruits. In the absence of such facilities in India, not only wastage of horticultural production occurs on a large scale, but domestic and export marketing is rendered costly and difficult. Provision of cold storage facilities, however, involves substantial financial outlay and any expansion has to be preceded by a careful assessment of the requirements. The Survey has estimated an investment of Rs 7.5 million for establishing 15 warehousing and cold storage centres over the next 5 years

3.4 PROCESSING

Sugar. Sugar represents an important ingredient in most processed fruit products. Even the controlled price of about Rs 170 ($ 23) per quintal at which sugar is made available for export purposes to the processing industry in India is three to four times as high as the corresponding prices in major supplying countries. For instance, among the Survey countries the price at which sugar is made available for export purposes varies from $ 6 per quintal in France and UAR to $ 10 per quintal in Spain and Singapore. Sugar is provided to the processing industry at a uniform price of $ 8 and $ 10 per quintal in Denmark and Singapore respectively, without any discrimination between the domestic and export markets. On the other hand, Lebanon offers sugar at $ 9 per quintal for export purposes as against the normal price of $ 20. The distinction made between the domestic and export markets is more pointed in UAR, where sugar is made available at the rate of $ 6 per quintal for export production as against $ 36 otherwise payable.

Following the partial decontrol of sugar in 1967, for that part of the production which goes to the domestic market, the Indian industry has to procure sugar from the open market paying a price as high as Rs 300-400 per quintal. This adds significantly to the cost of production, requiring the products to be offered at exorbitant prices in the domestic market. The retarding effect on the domestic demand, which is very limited as it is, follows as a logical corollary. While export prices cannot for obvious reasons be loaded with overheads, the industry is thus in no happy position to shift the burden entirely to the domestic market either. It is arguable that the solution lies in the industry orienting itself heavily towards exports. However, even ignoring for the moment other elements of costs and other considerations, the controlled price of $ 23 per quintal at which sugar is made available for export purposes is not something that can make export transactions rewarding, considering the much lower prices prevailing in other countries. The cash subsidy allowed on exports of sugar-based products (ranging from 3% to 12½% of the f.o.b. value) is no adequate compensation for this differential.

The foregoing analysis clearly shows that unless and until adequate assistance comes forth from the Government in this respect, the competitive position of Indian processed products continues to remain impaired in world markets. Considering that a sound domestic base is essential for sustaining the export effort of the industry, it is recommended that the entire requirements of the processing industry, covering domestic as well as export markets, should be made available at controlled price. It may be mentioned that the total annual requirements of sugar for the processing industry amount to no more than 15,000 tonnes, which represents less than 1% of the total output of sugar in the country. The analogy of the pharmaceutical industry, for which sugar is made available at controlled price to meet the entire requirements, is relevant in this context. Besides, making sugar available at controlled price for the domestic market also would be in line with the policy followed in countries like Denmark and Singapore, where sugar is made available at a concessional price, to cover the entire requirements of the processing industry.

Apart from price, which is relatively the more pressing problem, there is need to improve the quality of the sugar, as the quality of the finished product cannot be better than that of the ingredients going into its making. It has been reported that the sugar made available at the controlled price for export purposes largely comprises sulphitation sugar, although it is well-known that carbonation sugar is more suitable to the industry's production, and even in this case, the grades offered are not above 'C'. Although better quality sugar is available in the open market, the prices are too exorbitant for the industry to afford. In the interests of improving the quality of the output, it is essential that the Government should make top quality sugar, comparable to the canners sugar commonly used in other countries, available at controlled price.

Cans. Cans represent a major cost element, accounting for 30 to 40% of the total cost of production in respect of most processed products. Can costs therefore merit close attention in any effort to secure reduction in production costs.

Current tinplate requirements of the proposed fruits and vegetables sector are estimated at 5,000 tonnes per annum. These are being met entirely from imports, as domestic production of the requisite type of tinplate has not come up to acceptable standards yet. There are at present two major integrated tinplate producers in the country: Tinplate Company of India Ltd, Jamshedpur, with an annual capacity of 80,000 tonnes and Hindustan Steel Limited, Rourkela, with a capacity of 50,000 tonnes. Tinplate produced by the former is by the outmoded hot rolled process and is basically unsuitable for making the 'open top sanitary' (OTS) cans required by the processed fruits and vegetables industry. Hot dipped cold reduced tinplate is available from the Rourkela plant, which has so far achieved a maximum annual production of 36,000 tonnes, being utilised for fabricating 'general line' cans etc., against the rated capacity of 50,000 tonnes. With the addition of new equipment currently being installed, there will be additional capacity of 150,000 tonnes of cold reduced electrolytic tinplate at this plant.

Although trials conducted at the Central Food Technological Research Institute, Mysore, have shown that the Rourkela tinplate is suitable for canning most vegetable products and certain fruit items under controlled conditions, experience has shown that it is not suitable for packing operations under conditions obtainable at most of the existing canneries in the country. The defects in the Rourkela tinplate have been attributed mainly to the high proportion of phosphorous and silicon contents in the base steel used, arising probably from the quality of iron ore used in making the steel. It would thus appear that unless the quality of the base steel is improved, no tangible improvement could be expected in the quality of tinplate produced, even when the new electrolytic line goes on stream. And till such time as the requisite improvement could be brought about in the quality of tinplate produced indigenously, there seems to be no alternative to continued dependence on imports.

Imports of tinplate are currently allowed from different sources, based on the availability of free foreign exchange resources and aid funds. Prices vary considerably depending upon the source of imports and terms of payment. USA is the costliest source, average price payable being about Rs 2,000 per tonne, c.i.f., irrespective of the terms of payment. Imports from other sources like Japan, Netherlands, West Germany and UK are considerably cheaper, average c.i.f. price varying around Rs 1,250 per tonne, for tinplate of comparable quality, when payment is made in free foreign exchange. But prices are pegged up considerably higher, upto about Rs 1,600 per tonne, when imports are effected under credit arrangements. It may be mentioned that only 20% of the imports during 1967-68 were financed from free foreign exchange resources, the balance having been covered by aid funds: roughly 40% from USA and another 40% from Japan and Netherlands.

The higher price paid for tinplate imported from aid funds entails a proportonate rise in the customs duty, which is levied on ad valorem basis, at the rate of 27½% of the c.i.f. value, although the countervailing excise duty, levied at the flat rate of Rs 375 per tonne, remains unaffected. Taking into account these two levies, it is clear that the difference in the landed cost between imports effected under credit arrangements from an expensive source like USA and imports financed with free foreign exchange from economic sources like Japan and Netherlands can be as high as Rs 1,020 per tonne*. Considering that as much as 40% of the current imports are obtained from USA and a further 40% from less expensive sources but financed by aid funds, the scope for bringing down the landed cost of tinplate by financing a higher proportion of imports from free exchange resources is evident.

The current export drawback on tinplate at the rate of Rs 888 per tonne covers on the average the customs and excise levies. Fabrication costs in India being comparable to those in other countries, can prices, asfar as exports are concerned, are more or less on par with those in other supplying countries. It should be mentioned, however, that net can prices in India (after taking into account the drawback) are still higher, by about 25%, in comparision with those in countries like UK. For instance, while the price of an A2½ can, after allowing for the drawback, works out to about Rs 0.35 in India the corresponding price in UK is only Rs 0.28. This is because while customs and excise levies are covered by the drawback, the higher price paid for imports of tinplate effected under credit arrangements does remain uncompensated for. It is evident that the higher the proportion of imports financed from free foreign exchange resources, the lower would

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* Derived as follows:

	Aid Funds (USA)	Free Foreign Exchange (Japan, Netherlands etc)	Difference
	Rs	Rs	Rs
C.i.f. price per tonne	2,000	1,200	800
Customs duty (27½% ad valorem)	500	330	220
Excise duty	375	375	-
Landed cost	2,925	1,905	1,020

be the landed cost of tinplate leading to lower can prices.

While the export drawback on tinpate represents more or less adequate compensation for the differential between internal and international prices, the procedure for payment of drawback needs to be streamlined so as to avoid the inordinate delays currently being experienced by exporters. Frequent revisions in the drawback rates should be avoided, and when a revision is made, it should be done sufficiently in advance or at the end of peak canning operations, so as to spare the exporters avoidable inconveniences.

Can prices for the domestic market, however, are very high, having risen about 80-85% during the past five years. The rise in can prices has been one of the important factors responsible for the substantial increase of over 100% in prices of processed fruit and vegetable products in the domestic market. Considering that a sound domestic base is essential for sustaining the export effort, the need for making cans available at more economic prices is evident.

It is therefore recommended as a minimal measure of assistance that imports of tinplate, to meet the entire requirements of the processing sector, should, as far as possible, be financed with free foreign exchange, instead of being tied up with credit arrangements, as is being done to a large extent at present. The demand on free foreign exchange resources will not to be too large, considering that current requirements of the processing industry amount only to 5,000 tonnes against the total of over 65,000 tonnes representing the aggregate import requirements of all user industries.

Apart from price, which is by far the more pressing problem, attention needs to be devoted to the quality of tinplate, mainly from the point of view of catching up with the latest improvements in technology. For instance, over 70% of the OTS cans in USA are presently fabricated from double cold reduced tinplate, which is considerably lighter and more economical than the coventional tinplate. Efforts should be made in the long run to produce this type of tinplate in the country.

Lithographed cans are becoming increasingly popular the world over, in view of the positive advantage from the standpoint of presentation. In fact, these cans represent a crucial factor in the context of India's stakes in the market for 6-oz juice pack. It may be mentioned in this context that USSR, which is a leading buyer of Indian mango juice, has been insisting of late on the product being packed in lithographed cans, although the size involved here is A2½ can. It has been reported that the requisite steam resistant inks, varnishes, coatings etc. for making lithographed cans are not currently produced in the country, because of the non-availability of quality resins. It is recommended that adequate imports should be allowed of these materials in the interests of improving the competitive position of Indian products. The possibility of importing the requisite resins for manufacture of these materials within the country may also be examined, which would probably be more economical from the long term standpoint. Alongside, efforts should be made to develop production of quality resins within the country, so that dependence on imports may not become a permanent feature.

The Survey estimates that in order to achieve the targets of exports proposed, requirements of tinplate would amount to as much as 30,000 tonnes in 1975-76 as against the current export demand of about 1,000 tonnes (Annexure I). If requirements of the domestic market are also taken into account, which are also expected to go up substantially, the total demand of the processing industry for tinplate would be much higher. Apart from ensuring adequate supplies of tinplate, from external or indigenous sources, there is need to examine whether the existing fabrication capacity in the country would be adequate to meet the additional requirements.

In the event of expansion of capacity, which will probably be necessary, careful consideration should be given to advantages that can accrue from decentralization of the fabricating industry. It is worth mentioning in this context that apart from the high prices of cans, freight charges involved in transportation of the empty cans from the fabricating factories to processing units situated in interior hinterlands represent an avoidable element of added costs. Overall economies in the production of processed products if fabricating units are located within the vicinity of processing units are considerable.

Another consideration that is of relevance in this context relates to encouraging processing units to have their own fabricating units, as is the case with some of the leading packers in major supplying countries. However, economies of scale represent a vital factor in fabrication: it has been reported that for economic run, at least 100,000 cans should be fabricated per day. Against this background , it would appear that it may not be advantageous for the processing units to have their own fabricating units, unless the scale of operations really warrants such integration. The experience of the only packer-fabricator in this field in India goes to support this. It follows that while keeping in view the scope for decentralization of the can fabrication industry in the context of allowing expansion of capacity, under the Industrial Development & Regulations Act, 1952, encouragement of packer-fabricators should be viewed with caution.

Corrugated Boxes. Corrugated board is one of the most widely used media for packing, in view of its versatile nature, making it suitable for packing a wide range of products, amenability to high speed automatic operations, low cost, light weight and ease in stacking and handling. In particular in the packing of fruits and vegetables, both fresh and processed, the use of corrugated cartons is now almost universal. Apart from their basic use as shipping cartons, to protect the contents during transhipment, corrugated boxes are being increasingly used as point-of-sale display material at the ultimate retail outlets through the use of attractive multicolour printing on the cartons.

There are numerous styles in the making of corrugated cartons, although the regular slotted box, which is comparatively economical, represents the most common style. Liners, pads, partitions and other auxiliary corrugated constructions are frequently used for interior packing, where special reinforcing, bracing or other protective features are needed. For all its apparent simplicity, designing of a corrugated carton is a highly technical function. For instance, by appropriate use of the above mentioned auxiliary constructions, it is possible to secure significant reduction in the overall weight and cost of the package. To arrive at the optimum design, it is necessary to take into account such details as likely exposure to himidity and extremes of temparature, in addition to the obvious particulars like size, weight and shape.

Ordinary corrugated board does not withstand exposure to moisture well - a factor that has to be especially taken into account in the packing of fresh fruits and vegetables. Impregnating or coating the elements with wax or vinyl resin is necessary to secure moisture resistance. Curtain coating wherein the coating formulation is flowed on the carton through a special machine, represents a recent technique developed for this purpose. In addition to offering protection against moisture, vapour, greese and other incursions, this type of coating, improves the appearance of the printing on the carton and imparts a remarkable attractive gloss to the corrugated surface. Constant improvements in the fields of printing techniques, ink formulations and receptivity of corrugated surfaces are greatly contributing to new advances in the field of corrugated packing.

Although considerable progress has been made in recent years in India in corrugated packing, the industry has still a long way to go to catch up with modern trends in this field. Carton costs in India are twice as high as those in most other countries, and improvements are called for in respect of quality. Scarcely any use is made of corrugated cartons in packing fresh fruits and vegetables at present in the country. While corrugated cartons are used for a considerable proportion of exports of processed products, particularly mango juice and nectar, the use of these cartons for transhipment within the country is very limited even in respect of processed items.

Apart from high prices of corrugated boxes, in comparision with the conventional wooden cases, refusal of the Railways until recently, to accept goods packed in corrugated cartons for transhipment at their risk has been an important factor limiting demand for these cartons. The Indian Institute of Packaging has recently succeeded in persuading the Railway Board to accept on a trial basis canned products packed in corrugated cartons for transhipment at Railway's risk. With the eventual acceptance of corrugated packing by the Railways, significant rise is expected in demand for corrugated cartons, leading to possible reduction in carton costs as a result of economies of scale.

Leaving out fresh vegetables like onions and potatoes, which are normally packed in gunny bags and string bags, and fruits likes oranges and mandarins, for which bruce boxes represent the most popular medium of packing, it is expected that a substantial proportion of fresh as well as processed fruits and vegetables will be packed in corrugated boxes. On this basis, requirements of corrugated board for exports of fresh and processed fruits and vegetables are expected to go up from the present level of about 200 tonnes to 2,500 tonnes by 1970-71 and 15,000 tonnes by 1975-76.

Machinery & Equipment. Machinery and equipment used by the processing industry in India leaves much scope for improvement by way of rationalisation and modernization. Equipment like automatic filling machines leads to considerable savings in costs through minimization of wastage in the production process and greater efficiency in operations. Equipment like automatic labelling machines (which are most commonly used in other countries) is necessary for giving a proper finish to the pack. Adequate foreign exchange should be made available for importing such equipment. However, there are more expensive types of machinery, such as vacuum evaporators, which it will be advantageous to manufacture within the country in collaboration with foreign machinery manufacturers. Similarly, for setting up new processing plants or expanding existing ones through installation of new modern equipment, India may in certain cases explore the possibility of securing the services of plant managers and other technical personnel who can offer expert advice on layout etc. The Government should offer the requisite facilities for importing such technical services wherever necessary.

The Survey has assessed the requirements of the processing industry and envisages an investment of about Rs 110 million over the next 5-year period. It is contemplated that a) assistance will need to be given to 10 selected units for modernisation, rationalisation, expansion etc, b) 8 new processing units will be required for the manufacture of orange segments, pineapple products, citrus concentrates, deciduous fruits and tomato products, and c) provision will need to be made for development of ancillary industries like packaging, machinery manufacture etc.

3.5 PRODUCTION FINANCE

The growing of fruits is an essentially long term entreprise and few farmers in India can afford to devote a large proportion of their land to crops which involve a gestation period of 3 to 5 years as in the case of peaches, oranges or apples. Even in the case of annual crops like bananas, onions etc., the problem of requisite finance for providing necessary inputs and marketing has always been on the fore. Existing financing and refinancing institutions like co-operatives, land mortgage banks and the Agricultural Re-Finance Corporation have not been able to offer adequate financial facilities for the growers because of various statutory and other limitations. Consequently, the growth of the Indian horticultural industry has not shown any perceptible development in the past few decades.

On the other hand, it has been found during the Survey, that most countries in West Europe are incurring large scale expenditure for modernising hortitulture. Respective Governments in co-operation with the specialised agriculture finance institutions have evolved a number of schemes under which the growers can secure the requisite long and short term finances. The Horticulture Improvement Scheme 1966 evolved under the Horticulture Act 1960 in UK, is designed primarily to help horticultural producers to improve the efficiency of their business. It provides grants to growers and horticultural producers and marketing co-operatives towards the cost of improvements in facilities for the production, storage, preparation for market, and the cost of building and equipping wholesale markets. Grants are given at the rate of one-third of the actual cost, the remaining being loans at nominal rates of interest. The Small Horticultural Production Business Scheme 1964 encourages small growers to take up horticultural management and thereby improve the efficiency of their business. The grant is a contribution to the working capital needed while they are carrying out an approved three-year programme which might involve re-organising the business, perhaps by changing the form of production which in turn could necessitate new methods or equipment. So also in France, the Government in cooperation with SICAS, FORMA (Fonds d' Orientation et de Regularisation des Marche's Agricoles) and FEOGA (Fonds Marche's Agricoles) and FEOGA (Fonds European d' orientation et de Garantie Agricoles) provides various schemes of financial support for developing the horticulture industry. In Switzerland, through the respective arboricultural centres, Government makes available necessary production finance for reparcelling of land, uprooting of orchards that are uneconomic and development of new nurseries.

Similar financial facilities to the growers in India may become essential in the implementation of any expanded programme of horticultural development. This is an area which would require detailed investigation with a view to determining appropriate ways and means of meeting the credit and financial requirements. It is suggested that a study group may be set up to make an intensive study of this problem.

3.6 MARKETING & DISTRIBUTION

Marketing Arrangements. Although importers-wholesalers, commission agents and other traditional outlets continue to import bulk of the fruit and vegetable items in the Western markets, in recent years, buying wholesalers groups and corporate chains have gained importance and their share in the total trade turnover is gradually increasing. In UK, for instance, multiple chain stores accounted for 37% of the total grocery turnover in 1966 as against 31% in 1962; voluntary groups represented for about 27% of the total food trade as against 15% in UK, during the corresponding period. The same trend is visible in West Germany, France, Switzerland and other European countries. Buying groups, voluntary chains and co-operatives for example, handled 95% of the total merchandising in West Germany in 1964 as against 5% undertaken by independent retailers not belonging to any group, co-operative or chain. Buying centres (Centre d' Achat) play a dominant role in the French wholesale market,'PARIDOC' being the best known with a turnover of $ 600 to $ 750 million supplying on a regular basis to about 28 chain stores and 5,000 retail outlets. Union of Swiss Co-operatives and Migros Co-operatives in Switzerland control almost 40% of the food trade of the country.

It would be evident from the above that the establishment of powerful vertical organisations has led to concentration of buying power in a few hands, enabling them to offer a wide coverage to a product. It has, therefore, been suggested that new entrants like India could advantageously enter into agreements with one of these organisations for initial introduction of the products. Fruthermore, these outlets comanding major chunk of the market, are in a position to undertake intensive promotional effort including demonstrations, special displays and weekly special offers for selected products.

In the distribution of fresh produce the producers marketing boards are increasingly playing a significant role in establishing marketing facilities and controls in the consuming markets. For example, the Citrus Marketing Board and Agricultural Produce Export Corporation (Agrexco) of Israel have exclusive agents in London, Antwerp, Munich, Hamburg, Paris and Rome for organising auctions and distribution of different fruits and vegetables. On the basis of market intelligence provided by the agents, Israeli export organisations adopt suitable marketing strategies in terms of price fixation and sales promotion. Similarly, the Australian Apple and Pear Board, Jamaica Banana Board, Kenya Fruits and Vegetables Marketing Board and South African Banana Board operate more or less on similar lines in European markets. Most marketing boards, it is reported, select a panel of wholesalers to sell their produce on commission basis. The representatives of the board in main consuming areas will have however, the authority to auction or withdraw the produce from the auctions, depending upon the market situation. Such institutional arrangements appear to be imperative for effecting fresh produce exports.

Another important market characteristic of trading in fruit and vegetable items relate to the predominance of buyers' labels as against overseas packers' labels. It has been estimated that over 40% of South African canned food shipped to UK in 1966 was marketed under local buyers' lables. In West Germany, more than 25% of the South African and Australian canned goods are estimated to be marketed under local German labels. Strict quality measures are enforced by the chains opting to sell imported products under their own labels. This is an area which offers adequate prospects for Indian processors in selling their products in the European markets. A number of importers contacted during the Survey showed interest in selling Indian items, including mango products, fruit juices and canned pineapples, under their own labels. The proposed two Corporations and Consortium should explore the possibility of marketing Indian products through the established channels of some of the leading foreign companies, especially in the case of processed items. For this purpose, suitable tie-up arrangements with major overseas distributors and re-packers would be an appropriate strategy.

Common Brands. Major supplying countries market their fresh fruits and vegetables under a common brand name. Jaffa' oranges and 'Carmel' fruits (other than oranges) and vegetables of Israel, 'Chiquita' bananas of the United Fruit Company of USA, and 'Outspan' fruits and vegetables of South Africa are some of the instances. The two Corporations and the Consortium recommended earlier should explore the possibility of promoting identification of India's fruits and vegetables exports through common barnd names.

Price Systems. Prices of fresh fruits and vegetables are governed by several factors varying from country to country and commodity to commodity. For instance, the system of Reference Prices of ECM with regard to fresh produce is designed to safeguard the interest of the member countries.* These prices which take account of seasonal variations, are calculated on the basis of average prices derived during the three preceding years on the product markets where the lowest of each member country prices prevail. The reference price in effect serves as a floor price to the ECM market and if the landed price from third countries is below this figure, such imports may be subject to a countervailing charge equal to the difference between the reference price and the landed price of the product concerned, excluding customs duties.

As for bananas, prices are generally fixed all the world over on the basis of long-term (including revolving, annual or biennial) contracts. In the case of Israeli oranges, sole selling agents or importers are obliged to buy 25% of the consignments on a fixed price basis (the price being fixed by the Citrus Marketing Board) while the remaining are to be sold at auctions. Further, in certain markets like Hamburg, Munich, Antwerp and Rotterdam, it is necessary to sell the produce through auctions and in such cases fluctuations in prices are inevitable. As a new entrant, India has to cope with problems arising from such situations.

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* Reference prices have been established for the following products: apples, pears, plums, peaches, cherries, table grapes and tomatoes, oranges, mandarins and lemons.

3.7 TRIAL CONSIGNMENTS

Outside onions, India's exports of fresh fruits and vegetables are inconsiderable at present. Among processed items, only mango products like juice, nectar and pickles and chutneys are of any significance, and even in the case of these products, exports are by and large confined to selected markets. Exports of mango pickles and chutneys are directed mostly to UK, while USSR and Kuwait represent virtually the only outlets for mango juice and mango nectar respectively. Apart from the scope for expansion of current exports to these markets, the Survey has revealed definite prospects for exports of these items to other markets as well on the one hand, and exports of a wide range of other items on the other.

For instance, there are scarecely any exports of citrus fruits from India. While India currently does not produce established varieties like Washington Nevel and Valencia Late, which currently dominate the vast market that exists for oranges, the Survey has revealed that there is certain scope for varieties currently grown in the country, such as Mosambis and Maltas. Similarly, there appear to be definite prospects for the Indian Santras in Singapore and Malaysia. It is the considered opinion of the Survey that a substantial market could be developed for the Indian limes which, in view of their higher juice content, attractive yellow colur and thin, smooth skin, should prove to be an effective substitute for lemons.

The off-season market for table grapes in Europe is substantial, which is currently dominated by suppliers like Spain and South Africa. While India does not produce at present popular varieties like Alphonso Lavelle, American

Tessina, Regina and Red Emperor, available opportunities for varieties currently grown, such as Anab-e-Shahi and Pusa Seedless, need to be exploited. The Survey has also revealed that there could be good scope for exports of vegetables like aubergines, capsicums and French beans to the European markets.

As regards the processed products, mango products, which currently account for the bulk of production of processed items in India, are comparatively unknown in most markets with very few exceptions. Apart from exploring new markets for mango products, efforts should be made to ascertain and exploit prospects offered by items like lychee wholes, guava slices and guava juice, which are fairly well known in world markets, and typically Indian products like canned tinda, purwal and karela.

Thus a broad distinction can be made between different types of 'new' items, exports of which need to be developed on a planned basis. A commodity or product, which is fairly well established in a given market, can still be new in the sense that it is new from India, e.g., aubergines, capsicums, French beans, canned lychees. On the other hand, there are items like Mosambi, Santras and Anab-e-Shahi which will be new varieties from India of established species. Then there are items such as canned mango slices, mango juice and karela, which are rather peculiar to India and can be totally new in a given market.

In respect of all these new items, trial consignments represent the first step in the process of exploring markets. Trial consignments are required to assess the trade reaction, which will reflect to a large extent consumer reaction to the commodity or product offered. In addition to quality, which is an obvious requirement, it will be possible to test through trial consignments equally important factors such as the adequacy of packaging/packing adopted. Details of trial consignments considered necessary, in respect of selected fruits and vegetables, fresh and processed, related to specific markets, are given in the Chapter 2, dealing with Trade Prospects.

3.8 PRODUCT TESTING AND TEST MARKETING

Trial consignments, which are basically intended to assess trade reaction, need to be followed up as a rule by product testing and test marketing, designed to ascertain consumer reaction, before introduction of the item on a commercial scale becomes possible. This is particularly true of processed products. The objective of product tests should be to ascertain from the consumers whether the product as brought out is acceptable or any modifications need to be effected from the point of view of either quality or presentation. Even when a product from India is well established in a certain market (e.g. mango nectar in Kuwait), the requirements of a new market, where it is to be introduced, cannot be taken for granted on that basis. And when a new (from the Indian point of view) product like canned peaches or peeled tomatoes which is well established in world markets, is to be offered the need for product testing is perhaps even greater, because comparison with ell-known brands will ensure inevitably.

Based on the results of product tests, and after incorporating the necessary modifications, if any, test marketing has to follow as the next step. The objective in this phase would be to assess consumer acceptance on a wider basis and simultaneously study aspects directly relevant to marketing. For instance, it should be possible on the basis of test marketing to arrive at certain conclusions regarding the pricing pattern to be adopted, promotional strategy to be followed, likely volume of sales that can be expected etc. It should be added, however, that in certain cases, it is possible to achieve the objectives set forth for product testing and/or test marketing through suitably planned consumer surveys.

Quite a few leading importers and distributors in the Survey countries have enviced interest in undertaking product testing and test marketing for selected Indian products in collaboration with Indian exporters. These steps should form part of any systematic effort to introduce new products from India in different markets. It is estimated that a total initial outlay of $ 60,000 will be required to conduct product testing and test marketing in selected markets for selected items, shown at Annexure J

3.9 SALES PROMOTION

After ensuring consumer acceptability and marketing feasibility through the exploratory efforts of trial shipments, product testing, test marketing etc., a well planned strategy will have to be evolved for effective publicity and promotion. Publicity and promotion is of equal significance to products already moving to certain markets, exports of which, the Survey has revealed, can be stepped up substantially, through adequate effort in this regard.

Major supplying countries of the world spend huge amounts on generic and brand publicity. The National Office of Agricultural and Horticultural Markets of Belgium, responsible for publicising and promoting the Belgian produce in foreign markets, incurred an expenditure of $ 1 million on overseas publicity during 1966-67. A like amount is allocated annually by the National Syndicate of fruits and vegetables in Spain for promoting Spanish oranges in European markets. SOPEXA, a semi-governmental body in France, expended about $ 200,000 during 1967 towards press publicity and organising 'French Horticultural Weeks' in the major European cities for popularising French fruits and vegetables. The Comite de banac of France is reported to have spent on generic publicity in the French market about $ 500,000 during 1966-67. The Swiss Fruit Union allocates about $ 250,000 for its publicity programme.

Fruits with established brand names like 'Jaffa' oranges and grapefruits, 'Michalen' apples, 'Chiquita' bananas, 'Carmel' fruits and vegetables, 'Cpe' fresh produce and 'Outspan' horticultural items are promoted in a big way in the Western markets. Advertising expenditure on publicising fresh fruits and vegetables in UK in 1967, for instance, aggregated about $ 600,000, of which $ 400,000 were devoted for TV publicity and the remainder for press publicity. Of the total TV expenditure, Israel alone expended about $ 250,000 for promoting 'Jaffa' oranges and grapefruits. The Australian Apple and Pear Board and the South Africa

Deciduous Fruits Board incurred an expenditure of about $ 224,000 and $ 70,000 respectively on branded sales promotion in UK during 1967. The sale of fresh produce under specific brands has become a well established practice in the West European markets in recent years, and as a result competing suppliers are allocating increasingly large sums on publicising their produce.

Publicity in the field of processed fruits and vegetables is equally significant. The Survey has revealed that 5% to 7% of the total turnover of large marketing companies is spent on sales promotion. Statistics collected during the Survey indicate that Del Monte's expenditure on publicity in UK alone was about $ 372,000 and that of SPC (American Company) about $ 245,000 in 1967. Media of publicity used include trade and consumer journals, television, hoardings, point-of-sale literature and demonstrations. Giveaways like trays and clendars, and gimmicks such as one small can free for two large cans are frequently employed for promotion of sales. Besides, participation in selected food fairs and exhibitions held in major markets are effective means of promotion of fresh as well as processed fruits and vegetables.

The above instances indicate the volume of financial support required for promoting exports of fresh and processed fruits and vegetables is msjor world markets. India cannot hope to accomplish worthwhile horticultural exports without publicity and promotional expenditure of comparable magnitude. Viewed against this background, the current annual expenditure of $ 27,000 (of which 20% represents generic publicity carried out by the Processed Foods Export Promotion Council) on overseas publicity for processed products cannot but be regarded as insignificant. No publicity is undertaken at present for fresh fruits and vegetables. It is imperative that adequate foreign exchange is made available for effective publicity and promotion for greater exports of fruits and vegetables, both fresh and processed.

The Survey envisages an outlay of Rs 40 million over the next five years, towards trial shipments, product testing, test marketing, consumer surveys, publicity and promotion. Initial expenditure on sales promotion, relating to selected fresh and processed fruits and vegetables, which appear to offer prospects for India in the immediate run, in major markets is reckoned at Rs 1.5 million or $ 200,000 (Annexure J).

EXPORT ASSISTANCE

In most countries, the respective Governments have been taking active steps for development of the horticultural industry with accent on exports. For instance, the French Government has launched upon a mammoth irrigation project designed to bring about 250,000 hectares of land in the southern regions of Languedoc, Beziers and Nerbonne under irrigation, exclusively for the development of horticulture. As a result of vastly improved irrigation facilities, together with Government aid in the fields of research, extension and finance, this area is repidly getting transformed into one of the largest and most productive fruit and vegetable growing areas in Europe. Following this and other measures of Governmental assistance, production of fresh fruits and vegetables (excluding potatoes) in France is expected to go up from the current level of 7.8 million tonnes to 11.0 million tonnes by 1970, a much faster rise being envisaged in exports from 430,000 tonnes to 900,000 tonnes. Similarly, under the irrigation project, 'Plan Badajoz' sponsored by the Spanish Government, the two valleys, Badajoz and Seville, in Spain covering a total arable land of 120,000 hectares, are expected to be developed into the lowest cost supplying areas for horticultural produce in the whole of Europe. This is expected to lead to a remarkable expansion of the processing industry in this area during the next few years.

The Government of Greece, which grants crop subsidies to the local deciduous fruit growers, is reportedly thinking of restricting the subsidies, in the case of peaches, only to those growers who substitute the current Elberta variety with firm fleshed clingstone varieties which, in both fresh and processed forms, enjoy a distinct consumer preference in the overseas markets. The Swiss Government follows a novel method for developing the horticultural industry in the country. More than 50% of the annual expenditure of over $ 1.5 million incurred by the Government through the arboricultural centres, by way of extending production finance, cash subsidies, publicity (within the country as well as overseas) etc., is met from revenues derived from tax on alcohol.

In most countries, various types of specific inducements are offered to promote exports of fresh as well as processed fruits and vegetables. In major supplying countries of Europe, minimum prices are guaranteed by the respective Governments for exports of fresh fruits and vegetables. Allowing drawback of import and excise levies on tinplate and supplying sugar at concessional prices for export purposes is almost universal. In Greece, cash subsidies are offered on exports of most horticultural items, amounting, in particular, to $ 0.01 - 0.02 per kg in the case of peaches and citrus fruits and $ 0.10 - 0.11 per kg in the case of tomato concentrates and paste. In some countries, fiscal incentives are also offered: in Singapore, for instance, corporate profit tax on export earnings is limited to 4% as against the rate of 40% applicable to profits accruing from domestic sales.

In addition, considerable institutional support is forthcoming to publicity and promotion in most countries. For instance, SOPEXA a semi-government organisation in France, finances publicity and promotional programmes of private exporters up to a maximum extent of 80%, besides carrying out substantial generic publicity for the French horticultural produce in overseas markets.

In the context of the highly organised competition, backed by massive institutional support, from major supplying countries, that India, as a comparatively new entrant, will have to face in world markets, the need for an integrated horticultural policy with a positive export bias is self-evident.

There is scarcely any special type of assistance for exports of fresh fruits and vegetables from India, which largely comprise onions at present. However, realization of the substantial potential outlined by the Survey in respect of different horticultural crops will entail need of specific types of assistance, which should be considered on the basis of the merits of the situation. In particular, it will be necessary to offer, in the initial stages, adequate subsidy on air freight to tap the off-seasonal advantages offered by the European markets, in respect of items like table grapes, strawberries and capsicums. Besides, adequate foreign exchange needs to be released to facilitate effective publicity and promotion; this is an essential requirement for increased exports of processed as well as fresh fruits and vegetables.

Major forms of assistance currently available for exports of processed fruits and vegetables include:

a) drawback on tinplate (₨ 888/- per tonne);
b) supply of sugar at controlled price (about ₨ 170/- per quintal);
c) drawback on sugar (about ₨ 4/- per quintal);
d) cash assistance (varying from 3% to 12½% of the f.o.b. value depending upon the sugar content in the product);
e) import replenishment (10% of the f.o.b. value).

Of these, the import replenishment is meant to cover the requirements of imported materials like pectin and citric acid; however, as these materials are freely available in adequate quantities against the Actual User licences, the particular advantage of this assistance is somewhat limited. The drawback on tinplate more or less covers the customs and excise levies, thus making can prices comparable with international prices. However, in the absence of any such assistance for the domestic market requirements, can prices in the domestic market are very high, adding significantly to the cost of production of the processed products. In order to offer some relief in this respect and thus enable the industry to develop a sound domestic base, it is necessary that imports of tinplate required by the industry should be financed with free foreign exchange instead of being tied up with aid funds, as is being done at present to a large extent.

The cash assistance allowed on exports of sugar-based products is meant primarily to neutralize the difference between internal and international prices of sugar. From this narrow point of view, the allowance at the current rate represents more or less adequate compensation for the differential. However, there appears to be a case for enlarging the scope of the assistance, to take into account, at least to some extent, higher domestic prices of other raw materials as well. It is suggested that as against the current rate of 3-12½%, cash assistance may be allowed at the rate of 10-20% of the f.o.b. value of exports. Apart from relating the rate of assistance to the sugar content in the product, there should be a built-in provision for a higher rate of assistance within the margin of 10-20%, so as to serve as a direct inducement for larger exports. This could be accomplished by offering additional assistance, say 5%, if exports of a certain unit exceed a specified limit, based on its performance during a specified number of preceding years. In allowing such an additional assistance, a suitable sliding scale could also be devised, so as to ensure commensurate reward for the effort involved in expanding exports at different levels. It may be mentioned that the type of built-in provision in the cash assistance scheme suggested here is already in vogue in respect of selected engineering items, basic chemicals and sports goods.

TARIFF COMMISSION ENQUIRY

The Tariff Commission has been holding periodic enquiries on the processed fruits and vegetables industry, laying special emphasis on specific aspects in each enquiry. The last one held in 1963 was essentially a price enquiry, concerned mainly with the need and scope for regulating domestic prices, statutority or otherwise. One of the specific areas of investigation related to the effect of the withdrawal of the subsidy on tinplate, available to the industry between 1958 and 1963, at a uniform rate of Rs 500 per tonne for the entire requirements of the industry. The Commission was, however, rather non-committal on this issue, possibly because it was too recent at the time of the enquiry (in fact, the subsidy was withdrawn while the enquiry was still in progress) to permit thorough assessment.

Subsequent to the withdrawal of the tinplate subsidy, the export drawback scheme was introduced, which continues to be in operation, although the drawback rates have been revised from time to time. This marked a basic shift in policy. While the subsidy on tinplate was applicable to the entire requirements of the industry, the drawback scheme affords relief only in so far as export requirements are concerned. Can prices in the domestic market have risen 80% since 1963: current price of A2½ cans is about Rs 480 per thousand cans as against Rs 270 in 1963.

Even the controlled price of about Rs 170 per quintal, at which sugar is made available to the industry for export purposes, is about four times as high as the international price. This differential is sought to be neutralized by the cash assistance offered for exports of sugar-based products. But as far as production for the domestic market is concerned, the industry has to pay a price as high as Rs 350 per quintal (on the average) which is 200% higher than the price prevailing in 1963.

The cumulative effect of the substantial rise in prices of cans and sugar, coupled with the rise in prices of other raw materials, on the cost of production of the industry has been very considerable. Prices of most processed products have gone up more than 100% in the domestic market during the past five years. Price elasticity of demand for processed fruit and vegetable products being very high at the existing level of incomes in the country, the net result has been a stunted growth of the domestic demand.

While the policy of making a distinction between requirements of the domestic and export markets may be justifiable as a means of inducing a shift in production in favour of exports, the importance of enabling the industry to develop a sound domestic base to sustain the export effort cannot be overemphasized. Indeed, any effort to promote exports in isolation, regardless of the requirements of the domestic market, would be self-defeating. The objective should be to develop the industry as an integrated whole. In the present circumstances, where the domestic base is so weak, not only adequate relief needs to be offered in respect of raw materials like cans and sugar, but even offering positive support to stimulating domestic demand may be considered. New sources of revenue may have to be found to lend financial support to promotional programmes within the country. When a country like Switzerland is utilising the revenue accruing from tax on alcohol to promote domestic consumption of fruit and vegetable products, there is no reason why India, which is committed to the policy of prohibition, should not emulate the example.

Against this background, it is suggested that the Tariff Commission should be requested to hold a comprehensive enquiry on the processed fruits and vegetables industry, with special reference to the need and scope of offering adequate relief in respect of major cost elements like cans and sugar, so as to enable the industry develop a sound domestic base for sustaining the export effort.

3.12 RESEARCH, EXTENSION AND DEVELOPMENT

In the over-all scheme of agricultural development, horticulture forms an important area which embraces research, extension, marketing and education. Responsibility of mobilisation and exploitation of horticultural resources primarily rests with the State Governments. The role of Central Government is advisory in nature. In the research and planning of horticultural programmes, however, the States look-up to the Centre for expert advice and financial support for implementation of the approved programmes. In the formulation of horticultural programmes, however, the State Governments are guided by the over-all objectives laid down by the National Horticultural Committee of the Union Ministry of Food and Agriculture. In respect of certain approved Central Schemes the State government also derives financial support for implementing them. Within this over-all set-up work relating to research, extension and marketing are carried out by different specialised organisations established in the country.

Research. At present, programmes of research are formulated by the Indian Council of Agricultural Research (ICAR), in consultation with the State Governments, and are implemented through the Indian Council of Agricultural Research Institute and its sub-stations and research stations of the State Governments. Of the various research programmes undertaken by the Indian Agricultural Research Institute mention may be made of the very good work done on standardization of rootstocks, varietal trials conducted on grapes and tomatoes with a view to evolving suitable strains and induction of parthenocorpy (seedlessness) in mango. Details relating to the research work done by IARI are appear at Annexure K

In the field of applied research, the Central Food Technological Research Institute has been doing commendable work. Storage of perishables at room temperatures, use of growth regulators as pre and post harvest sprays along with fungicides, standardization of harvesting, handling, transportation and packing techniques relating to bananas for export purposes, papain and pectin manufacture from the raw and mature papaya are some of the notable achievements of this organisation. Besides, CFTRI experiment research stations, located in different parts of the country, attempt at identifying regional problems so that more realistic research programmes could be formulated so as to serve the best interests of growers, processors and consumers. (Annexure L)

Another notable development in the organisation of horticulture research at the state level relates to the work entrusted to the newly established Agricultural Universities in the country. In consonance with this policy, research activity at the State level has been taken over by the Agricultural Universities in Gujarat, Himachal Pradesh, Haryana and Mysore.

The Indian Horticultural Research Institute, established under the aegis of ICAR, in Hesarghatta, Bangalore in 1967, is expected to undertake extensive research work on rootstocks, varieties and plant diseases, in collaboration with the regional stations in the South.

Extension. For carrying out extension work, the State Governments have full fledged directorates or horticultural wings. The extension work, in its present form, mainly includes distribution of quality seed materials, provision of imports like pesticides, insecticides, providing encouragement to progressive horticulturists by disseminating requisite information and training of mali gardeners. In this respect, the role of the Centre is confined to extending adequate financial support and review of achievements periodically.

Marketing. The Directorate of Marketing and Inspection is a premier organisation at the national level which looks after the orderly marketing of horticultural products, Here again, the role of the Directorate is essentially advisory in nature with the State Governments undertaking the implementation of the approved programmes. Among its functions, establishing appropriate grade standards and providing facilities for grading are important. However, success achieved in this field is limited as may be evident from the fact that only an infinitesimal part of 20 million tonnes of fruits and vegetables produced in the country is graded.

The Survey has revealed the existence of excellent technical know-how in India in the matter of horticultural and technological research. But no evidence, however, could be secured of the utilizarion of the valuable research findings by the farming, marketing and processing communities.

In important supplying countries like Italy, France and Spain, great emphasis in fact is laid on horticultural and technological research, specifically oriented to meet the requirements of the industry. Constant efforts are being made to improve the performance of existing varieties, evolve new varieties, improve methods of cultivation and harvesing, develop efficient techniques of harvesting,and processing, and bring about product development and innovation. For instance, in Italy, the palmetta system, originaly devised for peaches has now been successfully extended to apricots and pears as a result of research carried out by Instituto Di Coltivazion, Arborico, Belogna. Similarly, Instituto de Agronomical Technologia de Almentos in Valencia (Spain) has developed a simple method of processing grapes for separating flavour from the juice which can be re-mixed at the time of use. This institute is currently engaged, among other things, in assessing the possibilities of using blanca oranges for producing canned orange segments and in working out relative economics of freeze-drying and dehydration of vegetables. Close and effective liasion exists in these countries between the horticultural and processing industry and the research institutions, agricultural universities etc.

There is need in India to further expand and intensify research work currently being carried out by organisations like Indian Council of Agricultural Research, Central Food Technological Research Institute and other institutions, particularly to deal with special problems that may arise in the context of building up a sizable export-orinted horticultural industry in the country. The Survey envisages an outlay of Rs 30 million over the next five years towards assistance to research institutions for specific programmes.

3.13 TECHNICAL ASSISTANCE

Organising horticultural industry on modern lines and developing it into viable export sector is necessarily dependent upon the availability of adequate technical know-how and expertise within the country at different fields of fundamental and applied horticultural research, India's achievements are impressive and comparable to the research undertaken in major producing countries, there is much scope for further development. In the areas of production, processing and manufacture of requisite machinery, production, processing and manufacture of requisite machinery, it will need be beneficial to supplement the expertise and know-how available in the country with the services of foreign experts. A group of specialists including a horticulturist, soil scientist, entomologist, fruit technologist and fruit engineer may be required, for instance, to investigate the feasibility of developing a viable deciduous fruit industry in the country. The same holds good in the case of developing mandarins,oranges, grapefruits, pineapple and tomato industries. In addition, in the field of manufacturing expensive machinery like evaporators, filling machines etc. it may be advantageious to secure the services of foreign plant managers and other technical specialists who can offer expert advice and also work with machinery manufacturers in India so as to develop proto-type and subsequently manufacture them on commercial scale in the country. In this context, it is suggested that India should preferably seek the assistance of FAO for making available the necessary expertise under the Extended Programme of Technical Assistance of UNO. Alternatively, services of horticultural technologists could be sought from major producing countries like USA, Spain, Italy, France, Bulgaria and Yugoslavia.

While securing the services of foreign experts perhaps could meet the immediate requirements, from the long range point of view it would be essential to train a cadre of Indian personnel in the above fields who would be able to man the industry on efficient lines Under suitable technical assistance programmes, Indian personnel should be deputed to major producing countries like Italy, Spain, France and Bulgaria for requisite training.

3.14 NEED FOR INSTITUTIONAL SET-UP

Production, standardised supply, efficient marketing and sales promotion represent the key factors determining the scope and extent of participation in the highly competitive fruits and vegetables trade. In this respect, experience of supplying countries like Israel, Australia, Italy, Spain, France and Taiwan has shown that institutional arrangements of one kind or another are essential. When considered against the background of India's inadequate experience in this field and consequent dearth of operational and functional facilities, need for institutional approach for building up a large and diversified export trade in fresh fruits and vegetables cannot be over-emphasised. Even in respect of processed fruits and vegetables, in the exports of which there is evidence of enterpreneurship, collective and unified approach is called for to achieve anticipated large expansion of exports in the existing and new product lines. Before outlining the types of organisational set-up needed for the Indian fruits and vegetables industry, a brief account of the position obtaining in selected supplying countries is given below.

Israel

Efficacy of institutional effort in promoting exports of fruits and vegetables is amply demonstrated by the successful operations of Citrus Control and Marketing Boards and Agricultural Export Company (Agerxco) of Israel. While the Citrus Control and Marketing Boards, as their names suggest, are concerned with the development of citrus industry, the Agrexco is responsible for the export marketing of all Israeli fruits (other than citrus), and vegetables, flowers and honey and associated products. It is understood that Israel is contemplating to establish a separate organisation for processed products. Aggregate exports of horticultural produce of Israel amounted to $ 72.7 million in 1965, comprising $ 68.0 million of citrus, $ 2.7 million of other fruits and $ 2.0 million of vegetables, flowers, etc. Exports of processed products, mostly citrus juices, contributed about $ 23 million during this year. It is remarkable that a country of the size of 20,260 sq km, with cultivated area of 430,000 hectares and a population of 2.63 million and limitations of water resources and related natural endowments could emerge as a dynamic horticultural exporting nation and build up an external trade worth over $ 100 million during 1966. This fact goes to show that well directed and efficiently run organisations can contribute a great deal in effecting a break-through in the horticultural exports.

Citrus Control and Marketing Boards. The Citrus Control Board and the Citrus Marketing Board were established statutorily in 1942 mainly for rehabilitating the citrus industry which suffered a severe set-back during the Second World War. The principal task of the Citrus Control Board was to render all possible assistance to growers in cultivating the crop on modern and scientific lines and maintaining the orchards in proper condition. The Citrus Marketing Board was charged with the responsibility of pooling and marketing citrus production on a monopoly basis. Following the successful revival of the industry, functions and activities of these Boards, while remaining basically the same, became more extensive and diversified in keeping with the expanded production and exports. Magnitude of the scale of operations of the Boards will be evident from the fact that presently the annual production of citrus in Israel is over one million tonnes, of which about 600,000 tonnes enter the export markets. The present organisational features and activities of these Boards are briefly discussed below:

Structure. The Citrus Control Board is composed of 18 members representing the growers. These members are nominated by the Ministry of Agriculture out of a panel of names recommended by growers, 'Operating Groups'. All the citrus growers of Israel are members of one or another of five groups functioning in the country: 'Pardess Syndicate' representing 35% of the growers, Tunva Export (36%), Yakhin Ltd (24%) Russco and Pritas (together 6%). Growers are free to choose and join any of the operating groups, with the option of changing over to another group before a specified time at the commencement of each crop season.

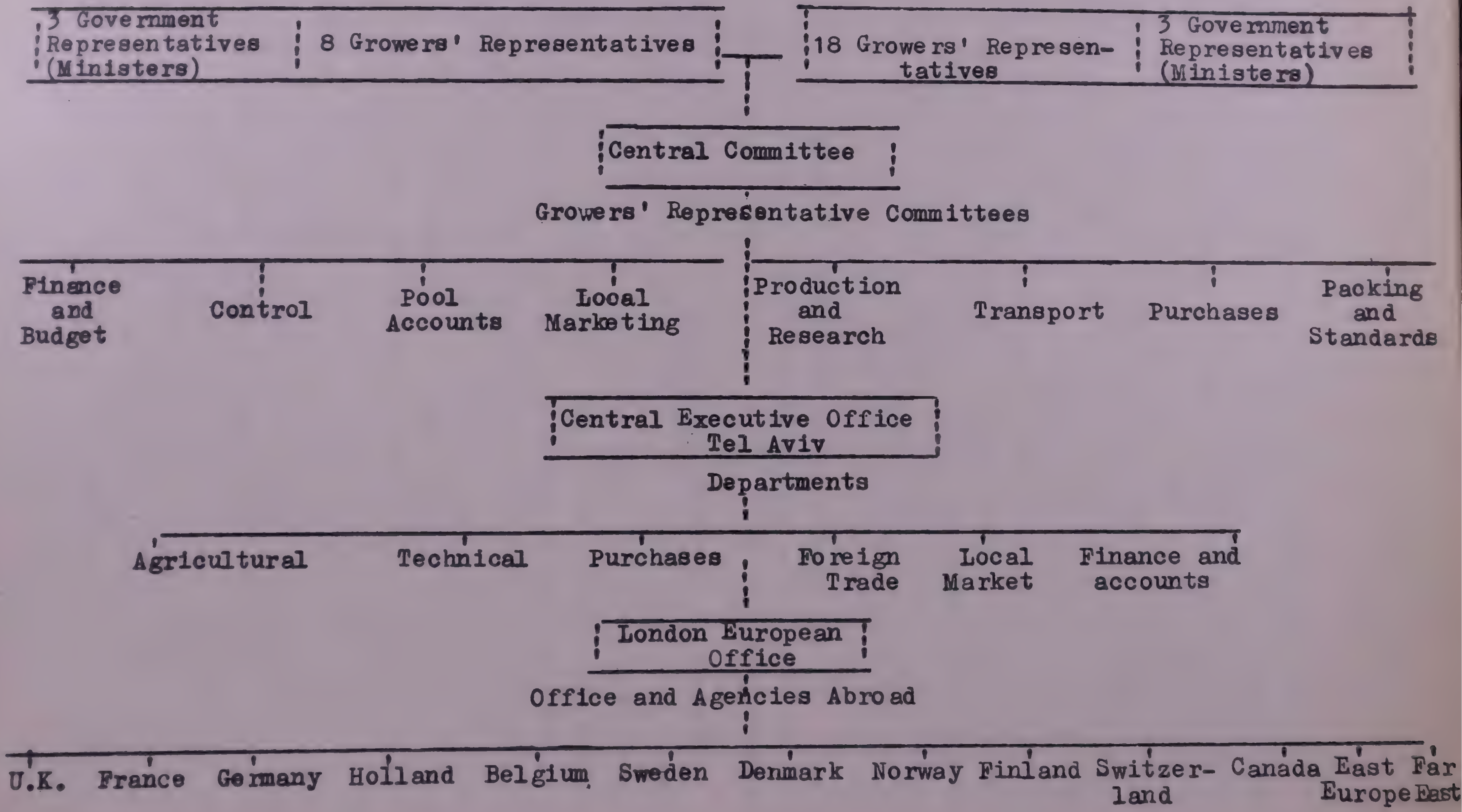
The Citrus Marketing Board comprises eight grower representatives nominated by the Ministry of Agriculture. In view of their closely inter-related functions, it is customary to nominate the same representatives to serve on both the Boards. Three Ministers of the Government, Minister of Agriculture (Chairman), Minister of Finance and Minister of Commerce & Industry serve as members of both the Boards. The administrative apparatus of the Citrus Marketing Board under its General Manager meets the needs of the Control Board as well. For all practical purposes, the two Boards function as a unified single agency.

The Citrus Marketing Board is assisted by a number of advisory committees, such as Pool Accounts Committee (which fixes the average prices of the fruit), Quality Standards Committee, Committee for Development and Expansion and Local Sales Committee. These committees lay down the policies and chalk out programmes for the guidance of the Boards for implementation. Direct participation of the growers in the functioning of the Boards not only ensures collective discipline in accomplishing the agreed targets and programmes but also brings about the desired rapport between the operating groups and the Boards.

For facility of easy reference, structute of the two Boards is graphically depicted in the Chart appearing on the next page.

Methods of Pooling and Marketing. The Citrus Marketing Board, as exclusive seller of the entire crop, prepares a detailed plan for disposal of the anticipated production at the beginning of each crop season. Based on the previous export performance in relation to each overseas market and on the expected quantum of supplies of export-worthy fruits, the Board determines market-wise allocations. Generally about two-thirds of exports are effected on consignment basis (i.e., for sale at auctions). The Board makes arrangement for bulk procurement of packing materials, negotiates sale contracts with large importers and concludes agreements with the shipping companies in respect of space and number of sailings required for the entire season. It also provides common facilities for grading and packing of the fruits at convenient points and enforces rigid quality control measures.

ORGANISATION AND STRUCTURE OF THE ISRAEL CITRUS BOARD



3 Government Representatives (Ministers)

8 Growers' Representatives

18 Growers' Representatives

3 Government Representatives (Ministers)

Central Committee

Growers' Representative Committees

- Finance and Budget
- Control
- Pool Accounts
- Local Marketing
- Production and Research
- Transport
- Purchases
- Packing and Standards

Central Executive Office Tel Aviv

Departments

- Agricultural
- Technical
- Purchases
- Foreign Trade
- Local Market
- Finance and accounts

London European Office

Office and Agencies Abroad

- U.K.
- France
- Germany
- Holland
- Belgium
- Sweden
- Denmark
- Norway
- Finland
- Switzerland
- Canada
- East Europe
- Far East

In order to ensure orderly procurement and export, the board appoints a number of contractors to act as collecting agents on commission basis. At present there are 6 approved contractors, mostly cooperative institutions, each of which is allotted a certain export quota for each variety of citrus fruits. All the growers are obliged to affiliate themselves with any one of these contractors and deliver the fruits at specified times according to the specifications of the contractors.

It is important to mention that many local organisations and cooperatives who may not have any officially recognized role in the marketing arrangements (say as contractors) operate as sub-contractors and serve as effective link between the individual growers and the approved contractors. These organisations have established modern large sized packing houses at convenient locations to cater to the needs of their members and contractors. For construction and operation of the packing houses, they receive partial financial assistance from the Citrus Marketing Board out of a revolving fund operated by it for the purpose.

For promoting and controlling effectively the marketing of the fruits abroad, the Board has set up a commercial organisation of its own with highly competent representatives and agents in each of the major markets, such as UK, West Germany and France (see the Chart appearing on the previous page). Besides looking after the sales and distribution functions, the representatives and agents maintain close liaison with the various concerned interests in the respective markets and arrange for efficient distribution of the consignments through carefully selected fruit brokers and wholesalers.

Pooling of Income. The most important feature of the Boards' marketing system is the pooling of the income from sales and the method of dividing the returns among the growers. The main principle of the system is that for each variety of citrus fruits, a basic price is fixed and 'off' and 'on' allowances are determined to provide for differences in quality, time of delivery, the quantity exported and the quantity sold locally. The Pool Accounts Committee of the Board sets out the criteria and rules in this regard at the commencement of each season. For instance, the following price structure was decided upon for Shamouti oranges for the 1964-65 season+ :

i) Basic price was fixed for a standard case of 74 oranges. Additional payments for other grades were as follows:

Grades*	Additional Allowance (Shillings)
150	3
180	4
218-288	5
333-420	4

ii) Proportional difference on the basic price according to the time of delivery was fixed as under:

Time of delivery	Extra payment over basic prices %
November 1 - January 15, 1965	0
January 16 - January 31, 1965	3
February 2 - February 12, 1965	6

Contd.

+Yehuda Chorin, 'Citrus in Israel', Israel Periodicals, Tel Aviv (1966).

Time of delivery	Extra payment over basic prices %
February 11 - February 21, 1965	9
February 22 - March 1, 1965	13
March 2 - March 11, 1965	17
March 12- March 21, 1965	22
March 22- March 31, 1965	27
April 1 - April 10, 1965	31
April 11- End of season	35

iii) In respect of quantities sold in the local market, the price was fixed on the basic average income per tonne secured with the following sliding differentiations according to the time of delivery.

	Extra payment over basic average (Isareli £/Tonne)
March 1 - March 15, 1965	5
March 16 - March 31, 1965	10
April 1 - April 15, 1965	15
April 16, 1965 - end of season	5

rate of additional payment for every week

Other Functions of the Board

Apart from ensuring efficient disposal of the citrus production, the Board plays an important role in the matter of determining the policy and future programmes of the development of the citrus industry. For instance, all the new plantations are subject to the approval of the Government Planning Centre and the Citrus Board. Licences are issued for all new growers by the Citrus Division of the Ministry of Agriculture and the Citrus Board, after the plot has been examined for its suitability of citrus cultivation.

The Citrus Board plans and implements aggressive publicity programmes in the overseas markets with the object of promoting increased sale of citrus fruits and projecting its brand name 'Jaffa' among the consumers. For instance, the Citrus Board spent over $ 250,000 for television publicity in UK for promoting 'jaffa' oranges and grapefruits in 1967.

Summing up, the functions of the Citrus Marketing Board may be stated to be all comprehensive right from the stage of determining the plan for production to that of disposal of the crop both in the domestic and foreign markets, taking such measures as may be necessary to ensure healthy development of the citrus industry. The Board has been vested with the necessary statutory powers and receives voluntary cooperation of all sections of the citrus industry

Agricultural Export Company (Agrexco). The Agrexco of Israel was established in 1960 mainly for developing export markets for a wide range of fruits & vegetables (other than citrus), cut flowers, honey and other related products. Controlled and managed by the growers and Government representatives, the Agrexco operates like a commercial organisation with monopoly rights in respect of exports of items mentioned above under the brand name 'Carmel'. It is significant to note that by adopting the strategy of selecting such items as offer off-season markets in Europe like strawberries, and items which are relatively new but have promise of potential like avocados, Agrexco has successfully diversified and expanded its exports over the last few years, reaching a level of $ 2.5 million in 1967. The range of fruits and vegetables presently exported by the Agrexco include avocados, artichokes, aubergines, asparagus, capsicums, courgettes, spring carrots, lettuce, new potatoes, onions, grapes, melons (Ogens and Honey Dew), loquats, custard apples, mangoes, pomegrenates, peaches and plums. Besides identifying the new and potential items, the Agrexco encourages the producers to grow the specified strains and varieties exclusively for exports and earmarks specified areas for their cultivation in order to exercise complete control at all stages of production for ensuring high quality standards.

Export marketing operations of the Agrexco are similar to those followed by its sister institution, Citrus Marketing Board. The Agrexco has its own representative (e.g. London) or exclusive agents (e.g. Copam in Italy) in major markets like London, Paris, Munich, Hamburg, Rome and Milano for arranging effective distribution of the produce through selected wholesalers. The Agrexco plans and executes systematic publicity campaigns based on the advice and suggestions of these representatives and agents, for promoting sales of 'Carmel' fruits and vegetables. A case in point is the inexpensive but effective publicity measures adopted in the sale of avocados through distribution of recipe booklets, display of point-of-sale material and through write-ups in women's and food journals.

Taiwan

In Taiwan, farmers' associations (organised on township basis) and co-operatives (set up on commodity basis) play an important role in the export marketing of fresh & processed fruits and vegetables. As a result of efforts of these organisations, Taiwan's exports registered an impressive rise from about $ 34 million in 1962 to $ 126 million in 1966.

Six fruit cooperative marketing societies, dealing mainly in bananas and oranges and with a combined membership of 98,000 growers, are at present operating in Taiwan. These societies have established a net-work of 400 collecting and packing stations in different parts of the island for the purpose of pooling, grading and packing of the produce of the members for exports. The cooperatives are also responsible for effecting export sales of the produce and for undertaking other related functions such as arranging supplies of packing materials and transportation and entering into suitable sale agreements with the foreign buyers on a long-term basis. The successful functioning of the cooperatives will be evident from the remarkable increase in their exports of bananas from about 44,000 tonnes in 1962 to 386,000 tonnes in 1966, representing over 90% of Taiwan's total exports of this item. Likewise, exports of oranges for the co-operative sector rose from about 17,000 tonnes to 70,000 tonnes during the same period.

During the last four years, the Provision Farmers Association (PFA) has been endeavouring to develop exports of onions, an item which used to be imported into Taiwan until a few years ago. For this purpose, the PFA has set up 8 packing stations, mostly in the Southern tip of the Island where the crop is grown, for the use of growers and exporters.

Farmers' associations play a very important role in the matter of establishing rapport between the growers and the canning units in Taiwan. Arrangements established for regular supply of asparagus and mushrooms to the canning units provide good examples in this respect. Prior to commencement of the planting season, Taiwan Government determines targets of production of asparagus and mushrooms, and allocates planting acreages to each township and canning quotas to each cannery. In these matters, the Government invariably acts on the advice of the farmers' associations. Within the designated procurement area, the canning units enter into contracts with the growers for supply of specified quantities at mutually agreed prices. In determining the prices, the farmers' associations representing the growers and the canners' association representing the canners bargain collectively with the concerned government authorities acting as arbitrators. The farmers' associations run a number of collecting stations to facilitate delivery of the produce by the growers to the canning units. At the collecting stations, the produce is graded under the supervision of the officials of farmers associations and delivered to the canning units. It is significant to note that canned asparagus, a relatively new product line for Taiwan, and canned mushrooms have since emerged as one of the significant items of exports of Taiwan as may be seen from the data given below:

Taiwan's Exports of Canned Asparagus and Canned Mushrooms*

(Million Dollars)

Year	Canned Asparagus	Canned Mushrooms
1962	Nil	8.5
1963	Neg	16.2
1964	0.4	15.8
1965	11.0	20.8
1966	14.2	25.3

Netherlands

Netherlands provides a good example of effective marketing of fruits and vegetables, which has enabled this country to develop a sound horticultural industry catering to domestic and export markets. Horticultural exports of Netherlands, comprising mostly hot-house and open-field vegetables, had shown consistent increase in recent years, reaching a level of $ 338 million in 1966. Main market organisations of Netherlands consist of veilings or auction centres, their federated body called the Central Fruit and Vegetables Veilings Bureau and the Fruit and Vegetable Board (Produktschap Voor Groenten en Fruit). Their role and functions are briefly discussed below.

(Next Page)

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* Export and Import Exchange Settlements for the year of 1966, Bank of Taiwan

Veilings. Main function of the veilings or auction centres is to sell the produce of their members (growers) at maximum possible prices through auctions. Over 130 veilings are presently functioning in Netherlands with their sales turn-over exceeding $ 250 million. Majority of the auction centres are owned by the co-operative institutions and only a few are run by commerical companies and private individuals. Their method of working, however, is similar, irrespective of the ownership. Besides selling, the veilings offer various services to grower-members including provision of facilities for grading and packing in and around the auction centres, cold storage facilities and supply of 'returnable' packing materials. Quality control and enforcement of quaility standards are also carried out in the auction centres.

Minimum Price. By far the most important feature of this marketing system relates to the guarantee of minimum prices offered to the growers by the veilings. At the beginning of each season (and during the season where necessary), the Central Bureau of the Veilings fixes appropriate minimum prices for different fruit and vegetable items, and these prices form the basis of sales at the auctions. In the event of prices offered in the auctions falling below the minimum, the growers are suitably compensated from the 'Special Funds' maintained for different items. The compensation prices are usually fixed at 80% of the minimum price for grade 'Extra' and grade I and at 60% for grade II. No compensation price is paid for lower quality produce. The unsold produce is disposed of to the processing industry or sold as fodder and the sale proceeds are taken to the accounts of the funds maintained for the respective produce. For raising the special funds the veilings collect a levy from the producers at the rates prescribed by the Central Bureau and it is obligatory on the part of the producers to pay the levies.

Central Fruit and Vegetable Veilings Bureau. All the veilings have been federated into one apex organisation called the Central Fruit and Vegetable Veilings Bureau. The Bureau is vested with the necessary powers to fix the minimum prices and to decide on appropriate regulations for proper functioning of the veilings. The Bureau is assisted by a number of Commodity Advisory Committees which review the supply and demand position in respect of the items concerned and make proposals regarding minimum prices, compensation prices and levies to be collected on the produce for financing the guarantee price scheme. The Central Bureau invariably acts on the advice and suggestions of these committees.

The other important functions of the Bureau include collection and dissemination of market information and promotion of sale of fruits and vegetables in the domestic and overseas markets. The sales promotion expenditure is met by collection of a small levy on the total turnover of the veilings.

Fruit and Vegetable Board. The Board, constituted in 1956, is a non-official vertical organisation managed by representives of growers, veilings, wholesalers, processers, exporters and importers. The Board, however, functions like a public authority with powers to issue statutory regulations covering the fruit and vegetable sector, subject to the approval of the Ministry of Agriculture and Fisheries. For instance, regulations of the following nature are issued by the Board.

i) Regulations concerning grading, sizing and packing of fresh produce to be sold in the veilings;

ii) Rules with regard to grading, sizing and packing of exported and imported items;

iii) Quality Standards to be observed in respect of processed products;

iv) Restrictions on production of certain kinds of fruits and vegetables.

The Board plays an important role as adviser to the Government in all matters concerning the fruit and vegetable industry. The officials of the Board are usually appointed as members of the Netherlands Delegations to the European Economic Community, OECD, and other international organisations.

France

France is an important exporter of fresh and processed fruits and vegetables in Europe, with its annual exports amounting to $ 188 million. Main organisations concerned with fruit and vegetable industry in France include (i) Societe Integre Cooperative Agricole (SICA), (ii) Societe Pour Expansion des Ventes des Products Agricole at Alimentaries (SOPEXA), (iii) Centre Technique Interprofessional des Fruits et Legumes (CTIFL) and (iv) Fondes de Orientation et de Regulation des Marches Agricoles (FORMA).

SICA. Sicas are specialised growers' cooperative production and marketing societies organised mostly on commodity basis. These societies, numbering over 240, are particularly active in the fruit and vegetable sector. While these societies have proved effective in the marketing of the produce in the internal markets, their performance in the export field have not been satisfactory. In order to infuse commercial expertise to these organisations in the field of exports, the Government of France has permitted recently participation of the trading community in their activities on an experimental basis.

SOPEXA. Set up by the French Institute of Foreign Trade and the Government of France in 1955, SOPEXA is mainly concerned with promotion of fresh and processed fruits & vegetables of France in the overseas markets. Finance for this Organisation is provided by the traders & professional bodies and the Government of France in the ratio 3:1. The main types of publicity programmes carried out by this Organisation include organising 'French Horticultural Weeks' in various cities of Europe and USA, participating in food fairs and exhibitions, assisting the exporters in formulating their publicity campaigns, and undertaking generic publicity for the

French horticultural produce. Mushrooms, tomato concentrates, peas (fresh and processed), grapes & wine, apricots, peaches and canned juices constituted the principal items which were taken up for intensive sales promotion and for this purpose SOPEXA spent a total amount of $ 200,000 during 1966-67.

CTIFL. This is a professional techno-economic organisation constituted under the aegis of the French Government. The traders, processors and manufacturers of packing & other ancillary materials constitute the members of the organisation. Its functions, inter-alia include (i) testing the suitability of newly evolved varieties and strains on a field scale for evaluating their performance, (ii) undertaking feasibility studies, (iii) studying the methods of distribution and suggesting improvements, (iv) recommending measures for improvements in the quality control techniques and enforcement and (v) conducting periodical consumer surveys in France and abroad

FORMA. This is a national level agricultural financing institution set up by the Government of France. This institution extends long-term (5 years) and short-term (1 year) production loans to the growers at nominal interest charges. Loans are also given for construction of packing houses, setting up of processing units and for purposes of basic horticultural development.

Spain

Spain is one of the leading producers and exporters of fruits and vegetables, notably of oranges, grapes, melons, tomatoes and onions. Its total exports of fresh fruits and vegetables were of the order of $ 160 million and of processed products $ 83 million in 1965, representing about 30% of the total export trade of Spain.

The main feature of institutional set-up obtaining in Spain relates to the semi-official Syndicates established for various sectors of industry and agriculture. Of the 27 Syndicates presently functioning in Spain, 'Sindicato National de Frutos Y Productos Horticolos' (National Fruit and Horticultural Syndicate) established in 1941, is concerned with the fruit and vegetable industry.

It is compulsory for the producers, processors, packers, exporters, wholesalers, retailers, processing equipment manufacturers, ancillary industrial manufacturers (packaging etc.) to become members of the Syndicate. For example, composition of membership in respect of citrus crop in 1967 was as follows:

	No. of Members
Producers	140,000
Exporters	650
Processors	50,000
Associated industries	60

Structure. The Syndicate is managed by a National Executive Board (NEB) which is composed of representatives of the producers and the trade elected by the Provincial Bodies of the Syndicate. The president of the NEB is nominated by the Government. At the provincial level, Provincial Executive Boards are set up, comprising members elected from among the producers and the trade once in 3 years. The president of the Provincial Board is elected by its members. A number of groups are constituted at provincial and national level for different products/product-groups which form the primary organisational unit of the Syndicate.

Functions. Being a collective forum of all interests concerned, the Syndicate serves as the spokesman of the industry and as consultative body to the Government on all issues affecting the development of the industry. With its own resources and powers, the Syndicate performs various functions including collection and dissemination of information, undertakes generic overseas publicity and negotiates with transport and shipping companies for securing reasonable freight rates. It is important to mention the publicity campaigns undertaken by the Syndicate in major European markets for Spanish oranges in recent years, which have boosted up the image of Spain as supplier of high quality fruits. For instance, in 1967-68, the Syndicate spent about $ 93,000 for publicizing Spanish oranges in Europe. For formulating the appropriate publicity programmes and ensuring their implementation, the Syndicate has set up a separate cell called 'Council of Propaganda' which includes representatives of producers and trade.

Another notable function of the Syndicate relates to labour welfare measures. At the commencement of each crop season, the Syndicate, in consultation with the employers and labour, fixes wages for different categories of workers employed in the fruit and vegetable industry and arrives at an agreement called 'Convenio Colectivo' (Collective Salary

Agreement). The Syndicate also undertakes labour welfare measures such as labour insurance, running hotels for workers children and maintaining summer resorts for workers.

Activities of the Syndicate in the sphere of production and marketing of bananas through a separate regional organisation in Canary Islands (CREP) have been discussed in detail, in the Section on Bananas of Volume I Part B of the Report.

Finances of the Syndicate are derived from collection of a levy at the rate of $ 0.29[+] per tonne of fruits and vegetables exported from the country. For purposes of meeting the publicity and sales promotion expenditure, the Syndicate collects an additional levy of $ 0.70 per tonne. For implementing the labour welfare schemes, the Syndicate collects 2% of wages paid to the workers, 1% each from the workers and the employers. Payment of this levy is made by the employers on a monthly basis.

Other Countries

Australia. Australia is one of the major suppliers of fruits and vegetables and has made deep inroads into UK and other European markets in recent years. Like other supplying countries, Australia has promoted its exports of horticultural produce through organised institutional effort. The Australian Pear and Apple Board which is a statutory organisation, is vested with powers to regulate shipments, determine export quotas, allocate consignments from each state and recommend the licencing of exporters. Its role in promoting sale of apples and pears in the UK market in recent years is significant. For instance, in 1965-66 the Board spent about $ 82,400 in UK on sales promotion campaigns for apples and pears.

Lower rates are charged on potatoes and onions, as these are low priced items.

Italy. Instituto Nazionale Per il Commercio Estero (Italian Institute of Foreign Trade) functioning under the supervision of the Ministry of Foreign Trade, plays an important part in the export promotion of Italian products and commodities, including fruits and vegetables. Among its functions, enforcement of quality control on fresh fruits and vegetables and undertaking publicity programmes in overseas markets are important. Annually an expenditure of about $ 160,000 to $ 320,000 are incurred by the Institute on publicity for fruits and vegetables.

Instituto per le Ricercha e le Informazioni di Mercato e la Valarizzione della Produzione Agricola (The Institute for Market Research and Information), set up under the auspices of the Ministry of Agriculture, is an organisation concerned with carrying out economic studies on agricultural commodities (mainly fruits and vegetables) and tendering suggestions to the Government on policy matters.

In the important supplying countries like South Africa (The South African Citrus Board, Deciduous Fruit Board, Banana Board and Outspan Organisation), Lebanon (The Lebanese Fruit Office), Denmark (The Danish Horticultural Marketing Association), Kenya (The Kenyan Fruits and Vegetables Marketing Board), and Jamaica (The Jamaican Banana Board), organisations of one kind or another have been established to promote horticultural exports.

Organisational Set-up Required for India

Instances offered by major supplying countries discussed above clearly underline the significance of the institutional arrangements in developing production and exports of horticultural produce. It is imperative that

India, which will be a new entrant in world markets in this field should, like-wise, devise an appropriate institutional approach in its efforts to develop an export-oriented horticultural industry. In view of the need for effective combination of various technical skills in the spheres of horticulture, transport, packing, packaging and marketing for the development of export trade in fruits and vegetables, development of sound and dynamic institutional effort is also essential.

At the present stage of horticultural and marketing development in the country, it is difficult to visualise the possibility of private trade undertaking the difficult task of nurturing, expanding and developing the export markets in fresh fruits and vegetables. In most cases the problems will need to be tackled right from the stage of production through procurement, grading, packing, etc. to that of placing the produce in the consuming markets. Further, the export promotion of fruits and vegetables will need to be based on 'Package Programme' approach.

Against this background, it is considered that there is need for creation of three All-India Organisations - one for augmenting exports of bananas, another for developing exports of fruits (other than bananas) and vegetables and the third for effecting accelerated exports of processed fruit and vegetable items. A separate organisation is suggested for bananas alone in view of the complicated operations inherent in their exports, the large scale expansion of exports envisaged in the next seven years and its long range potential. The structure and functions of the proposed organisations are briefly discussed below:

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i) Banana Development and Export Corporation. At present, there are four organisations concerned with the banana industry in India: State Trading Corporation, Banana Fruit and Development Corporation, Gujarat State Fruits and Vegetables Marketing Federation and Jalgaon Banana Co-operative Marketing Federation. Although these organisations have been endeavouring to boost banana exports for the past few years, their exports have met only with limited success for lack of a comprehensive approach (Annexure M).

For the development of banana exports on an integrated basis therefore a central organisation - Banana Development and Export Corporation - has been suggested which should be set up in the shape of a commercial corporation. Initiative for setting up this organisation should be taken by the Ministries of Food and Agriculture and Commerce, Government of India, in consultation with the states which have interest in the production and exports of bananas. The Corporation should be developed in such a manner that the existing organisations could be merged into it by participating in share capital. It will be desirable to secure association of the producers with the Corporation but the association of cooperatives of producers should receive preference. Following are some of the major functions which would need to be undertaken by the proposed Corporation:

a) Organisation of field tests for determining the appropriate varieties which will be most suited for cultivation in the respective areas from the point of view of exports;

b) Selection of suitable areas for development of production;

c) Establishing rapport with the co-operatives of growers as well as individual growers for securing supplies on long-term basis;

d) Providing technical guidance in the matter of scientific cultivation, transport and handling of the fruit;

e) Setting up of packing houses and creation of necessary infrastructure (feeder roads, transportation, ropeways, etc.);

f) Provision of necessary inputs, financial assistance and credit to the growers' cooperatives and growers;

g) Manufacturing and use of the right type of carton for packing bananas;

h) Chartering of bananas boats on longer term basis for keeping up the delivery schedules and to achieve overall economy in ocean freight rates;

i) Regulation of purchase, sale and export of bananas;

j) Execution of sales agreements with selected foreign buyers and countries;

k) Effective promotion and publicity measures.

It will be observed that the objective of establishing a commercial corporation would be to put together under one organisation the various sectors and operations, relating to this industry including agriculture, processing, packaging, transportation, marketing and financing, utilising the latest developments in research, technology and methods & systems for developing a viable banana industry in the country.

In setting up an organisation of this nature, it is suggested that the experiences of other countries in this field should be kept in view. Particular mention may be made of the Jamaica Banana Board which has been very successful in infusing stability into the Banana industry in the Island, since its creation in 1955. Details relating to this organisation are discussed in a subsequent section (Part B of Volume I, Section 4.1 of the Report).

ii) Fruits and Vegetables Export Corporation. In the previous chapter, we have indicated that the prospects for exports of fresh fruits and vegetables from India are considerable. For items like mangoes, lychees, grapes and strawberries and vegetables like aubergines, capsicums, onions and french beans, ready markets are available in

Europe and Asia, and if the existing potential has remained untapped so far, it is mainly because of the lack of any organised effort in the past. There is therefore a strong case for the creation of a central agency - Fruits and Vegetables Export Corporation - to organise production, procurement and export marketing of selected fruits and vegetables. The Corporation, it is suggested, may be set up on the model of AGREXCO of Israel. In the initial stages, the Corporation should concentrate on marketing aspects (that is mainly on promoting exports of the available commodities) and gradually expand its activities to other fruit and vegetable crops. While the structure of this Corporation will be similar to that of the Banana Corporation, its functions inter alia will include;

a) Instituting necessary research activities in co-operation with the other professional organisations in order to improve the efficiency and productivity of the horticultural industry in India;

b) Organising production of the required fruits and vegetables on a planned basis, and according to seasons, regions and varieties;

c) Providing technical guidance to the producers and producers co-operatives on improved methods of cultivation;

d) Provision of necessary inputs, financial assistance and credit to the growers' co-operatives and growers;

e) Establishing modern packing stations with a view to facilitating grading of the fresh produce at the producer's level;

f) Securing the most favourable arrangements for the purchase, handling, transportation, exports and shipping of fruits and vegetables;

g) Creating a national trade mark for the Indian fruits and vegetables and undertaking publicity programme on a regular basis in the foreign markets.

It is envisaged, that the Fruits and Vegetables Export Corporation will have, under its umbrella, all the necessary technical nad marketing skills so as to provide the requisite export orientation to the horticultural sector (other than bananas) in the country.

iii) Processed Fruits and Vegetables Exporters' Consortium. There appears to be a strong case for encouraging the formation of a consortium of exporters in the country. This suggestion finds support in the instances offered by Australia, Malaysia, South Africa etc., where export marketing, including fixation of floor prices, is fully controlled by powerful marketing boards. While no serious complaints have been voiced during the course of the Survey regarding undercutting among Indian exporters, some instances have been found where there was considerable disparity in prices offered by different exporters for the same product. This may be attributable to genuine differences in quality. But the importer abroad often does not have any knowledge of the relative superiority of one brand over another, and is understandably puzzled when confronted with simultaneous offers with varying prices from several exporters for the same item from the same source. This poses a problem in exporting to new markets and marketing new products.

It would, therefore, appear necessary and advantageous to encourage the formation of a consortium of Indian exporters, which could evolve a unified approach to marketing products, preferably under a common brand and at agreed prices. Such a consortium should also have the authority to ensure conformity of production to accepted standards. The evolution of a common brand will greatly contribute towards deploying the limited resources available to the maximum advantage possible in the field of overseas publicity. Further, the consortium will be the appropriate agency to draw upon the resources of the Marketing Development Fund of the Government of India for opening overseas offices, undertaking overseas publicity and carrying out market surveys.

If the formation of a separate consortium is for any reason considered impracticable, alternatively the functions of the existing Processed Foods Export Promotion Council would need to be suitably enlarged so that effective regulation of export marketing becomes possible.

3.15 PRIORITIES FOR DEVELOPMENT AND EXPORTS

It has been stated in the preceding section that opportunities offered by world markets for exports of fresh and processed fruits and vegetables are immense. India, with its natural advantages of diverse climates and soils, sizable production-base, geographic proximity to markets in South East Asia and West Asia, relatively low labour costs in the country etc., is in a favourable position to exploit this potential. Realization of this potential, however, demands concerted efforts to bring about a positive orientation in the horticultural industry in the country, which in turn calls for carefully formulated priorities for development and exports.

In the absence of determined efforts to make effective use of the physical and technological resources available in the country, no perceptible development has taken place in the field of horticulture during the past few decades. Even the importance of this sector to the national economy from the point of view of supplementing the inadequate production of foodgrains has not been recognized until very recently. No wonder, then, that there is scarcely any recognition in the country of horticulture as an industry in its own right, much less an industry with considerable export potential. Awareness is limited even of the dimensions of the problems relating to development of horticulture on modern lines. This only underlines the task involved in developing a modern horticultural industry in the country, with accent on exports.

The problems of horticultural development are varied and complex. Although some 20 million tonnes of fresh fruits and vegetables are produced in the country, the Survey has clearly shown that production of internationally established varieties is nil or negligible in respect oi most fruits and vegetables. To identify areas most suitable for given varieties, improve the quality of production and raise yields, detailed scientific investigations are required, calling for the application of diverse disciplines, including agronomy, pre and post-harvest physiology and cytogenetics.

While bringing about an overall development of horticulture throughout the country will no doubt be a laudable objective, the magnitude of the problem is such that it will take long period for any worthwhile results to be accomplished.

As far as development of an export-oriented horticultural industry is concerned, selectivity should be a basic guideline for the strategy to be adopted. Selectivity should be in terms of areas as well as crops to be taken up for development, viewed from the export angle. For instance, while there may be several regions ecologically suitable for the cultivation of bananas, so far as an export-oriented banana industry is concerned, the choice is obviously limited to coastal regions. As regards crops, preference should be given to those fruits and vegetables which are volume items in international trade. And based on the resources available in the country, priorities should be determined, both for the short and medium term. For instance, development of the deciduous fruits industry would take some time, as cultivation has to be initiated of the internationally accepted varieties of these crops, not presently grown in the country, which inevitably involves a gestation period of 5-7 years. On the other hand, it should be possible to develop a modern tomato processing industry in a relatively short period, as the tomato crop (of the requisite varieties) can be raised in a matter of months. The short term priorities should also take into account the prospects offered by some of the existing crops. For instance, the Survey has revealed that considerable prospects exist for fruits like Mosambi and Malta, currently available in the country. Here, while the long term objective should be to develop production of established varieties of oranges like Washington Navel and Valencia Late, opportunities immediately available for the existing varieties like Mosambi and Malta should be fully exploited by organising production for exports, ensuring adequate facilities for grading, packing, transportation, both inland and ocean, etc.

Keeping the above considerations in view, the Survey has identified the following items as having the maximum potential in the short term: bananas, mangoes, lychees, grapes, strawberries, onions, French beans, capsicums and aubergines among fresh produce and mango products, lychee wholes, canned vegetables and pickles and chutneys among the processed items. From the medium term point of view, prospects offered by volume items like citrus fruits, white fleshed onions, potatoes, canned peaches, pineapples, apricots, mandarin orange segments and juices (particularly citrus concentrates) and tomato products are substantial. Besides, efforts should be made to explore possibilities of commercial production of crops like avocados, cultured mushrooms (white), asparagus and salad type vegetables, which are being increasingly demanded in the overseas markets. Priorities in the development of different horticultural crops and identification of suitable areas for this purpose should be based on comprehensive feasibility studies.

3.16 FEASIBILITY STUDIES

Major areas expected to be covered by feasibility studies include: a) a thorough study of phenological factors like climate and soil; b) availability and need for improvement of facilities such as irrigation, power and transportation; c) susceptibility of varieties to be tried to pests and diseases; d) optimal location of processing units, taking into account sources of raw material supply, distance from the marketing centres/port towns etc; e) optimum lay-out of machinery and equipment in the case of processing units to be set up; f) socio-economic factors relating to the area chosen for development; g) financial requirements (Annexure N). It is essential that any effort to develop a modern horticultural industry in the country should be preceded by and based on such comprehensive feasibility studies.

It is suggested that crops to be covered by such studies should include in particular citrus fruits, pineapples, deciduous fruits and tomatoes. The Survey envisages a total outlay of Rs 5 million for feasibility studies during the next few years.

3.17 EXPORT TARGETS

Based on a detailed analysis of various factors relating to the pattern of consumption, projected growth in demand and likely changes in the supply situation in the Survey countries, and a study of the import structure and trends in unsurveyed countries, it has been possible to arrive at certain tentative estimates of exports considered feasible by 1970-71 and 1975-76. In arriving at these estimates, account has been taken of the existing resource base in the country and the possible development over the next few years. While detailed estimates appear at Annexure O, the following table shows a break-up of the targets suggested by major categories:

(Next page)

Exports of Fresh and Processed Fruits and Vegetables

Quantity: Tonnes
Value: Thousand Rupees

Major Items	1967-68 (Actual) Qty	1967-68 (Actual) Value	1970-71 (Target) Qty	1970-71 (Target) Value	1975-76 (Target) Qty	1975-76 (Target) Value
A. Fresh Fruits & Vegetables						
Fresh Fruits (of which)	4,367	4,809	15,000	16,500	133,000	118,000
Bananas	2,813	1,928	10,000	6,000	100,000	60,000
Mangoes	1,072	1,818	3,000	3,900	10,000	13,000
Citrus	240	416	700	700	15,200	19,000
Fresh Vegetables (of which)	105,565	43,941	130,000	56,000	177,000	87,000
Onions	103,362	41,831	125,000	51,000	150,000	61,000
Other Vegetables	1,651	1,640	2,800	3,000	16,000	16,000
(Sub Total 'A') including others	109,932	48,750	145,000	72,500	310,000	205,000
B. Processed Fruits and Vegetables						
Canned Fruits	151	566	900	2,280	67,200	124,700
Juices & Nectars	3,802	8,765	9,000	17,250	30,000	55,000
Pulps and concentrates	-	-	1,100	2,100	21,000	43,800
Jams and Marmalades	91	361	250	850	1,000	3,600
Canned Vegetables	512	1,943	800	1,600	10,000	37,000
Dehydrated vegetables	1	8	20	70	2,600	9,100
Mango pickles & chutneys	1,389	4,087	2,000	5,000	3,000	7,500
Mango slices in brine	149	249	1,000	1,500	2,000	3,000
Dried Mushrooms	18	2,619	30	3,000	50	5,600
Sub Total 'B' (including others)	6,189	18,376	15,000	37,500	140,000	295,000
Grand Total	116,121	67,126	160,000	110,000	450,000	500,000

It will be seen that exports of fresh fruits and vegetables are expected to go up from about 110,000 tonnes (Rs 49 million) in 1967-68 to the level of 145,000 tonnes (Rs 72.5 million) by 1970-71 and 310,000 tonnes (Rs 205 million) by 1975-76. Susbtantial rise is envisaged in exports of bananas, mangoes and citrus fruits. These three would in fact account for 80% of the total export earnings from all fruits in 1975-76. In view of the substantial rise in exports of fruits and other vegetables, the share of onions in the total value of exports of fresh fruits and vegetables, which is currently as high as 86%, would be no more than 30% in 1975-76.

While the present exports of processed items are largely confined to mango products comprising mainly mango juice, nectar and pickles and chutneys, substantial exports are envisaged of other items like pineapple slices, mandarin orange segments, deciduous fruits and citrus and tomato concentrates. As a result, exports of processed fruits and vegetables are expected to register a significant rise from 6,200 tonnes (Rs 18 million) in 1967-68 to 15,000 tonnes (Rs 37.5 million) by 1970-71 and 140,000 tonnes (Rs 295 million) by 1975-76.

In arriving at the above estimates, a major assumption has been made about the unit values that can be reasonably expected to be realized, on the basis of realising world prices for established items and the projected trend therein over the next few years. For instance, on the basis of current indication optimum realization in respect of citrus fruits cannot be more than Rs 1,250 per tonne, f.o.b., if exports of the magnitude envisaged are to materialize, although insignificant quantities are currently being shipped at higher prices. In the case of bananas, while the current f.o.b. price of Rs 685 per tonne is in tune with international prices a lower price of Rs 600 per tonne has been assumed for 1970-71 and 1975-76, in view of the anticipated decline in world prices during the next few years. As regards canned pineapples, pears and peaches, which are established items in international trade, while being new to India, a uniform price of Rs 1,700 per tonne, f.o.b., has been assumed, in keeping with current world prices for these products. While canned mango slices are being currently exported, in limited quantities, at relatively high prices, no appreciable rise in the volume of exports is considered possible unless this product is offered at prices comparable to those of leading canned fruits such as those mentioned above; consequently, a much lower price Rs 2,125 per tonne has been assumed for canned mango slices for 1970-71 and 1975-76. (Detailed assumption on unit values is given at Annexure P .)

3.18 INVESTMENT

Realization of the above targets of exports, which are considered feasible of achievement, entails sizable financial outlay in various sectors. Major areas, where investment is required, comprise: a) horticultural development; b) research and development; c) processing and d) export effort. A total investment of Rs 400 million is envisaged by the survey over the next few years;

break-up is given below under these major heads (Annexure Q).

Requirements of Horticultural Development for Exports. A total investment of Rs 210 million is proposed on this account, with the following break-up:

i)	Intensive development of crops in existing areas	- Rs 85 million
ii)	Development of crops in new areas	- Rs 75 "
iii)	Creation of auxiliary facilities	- Rs 25 "
iv)	Nurseries	- Rs 15 "
v)	Development of infrastructure	- Rs 10 "

i) In the short run, the existing areas under cultivation offer maximum scope for intensive development of the industry. It is felt that scientific application of inputs like fertilisers and plant protection measures, and adequate irrigation facilities, would raise the per hectare yield considerably. Initially it is suggested that an area of 35,000 hectares in different parts of the country should be earmarked on the basis of phenological surveys for growing selected items. The expenditure on inputs to be provided has been estimated at Rs 2,500 per hectare. The overall outlay thus works out to Rs 85 million.

ii) While existing areas can be brought under the purview of the development programme forthwith, the Survey places emphasis on efforts for simultaneous development of new land for cultivation of fruits and vegetables. This measure, which is considered essential in view of the need to expand the production base, should be possible of accomplishment within the medium range of time. The Survey considers that a maximum area of 16,000 hectares need to be developed for this purpose. The cost of development has been placed at

Rs 5,000 per hectare, leading to an overall investment of Rs 75 million for 15,000 hectares. (Annexure R)

iii) The two measures outlined above would result in substantial increases in output of fruits and vegetables. Auxiliary facilities for handling, storing, packing and transporting the additional production would need to be developed simultaneously to an adequate extent. This would entail a total outlay of Rs 25 million with the following break-up:

10 Packing Houses at a cost of Rs 250,000 each	- Rs 2.5 million
15 Warehousing and Cold Storage centres at a cost of Rs 500,000 each	- Rs 7.5 "
20 Refrigerated trucks at a cost of Rs 250,000 each	- Rs 5.0 "
50 Air Cooled wagons at a cost of Rs 200,000 each	- Rs 10.0 "

iv) Establishment of progency orchards or nurseries is visualised as an integral part of the development of the horticultural industry in India. These nurseries, apart from serving as agencies for experiments in growing fruits and vegetables, are required to provide demonstrations on methods of scientific cultivation. The nurseries to be established and the envisaged expenditure are shown below:

Bananas	-	Rs 4 million
Pineapples	-	Rs 4 "
Satsumas	-	Rs 4 "
Others	-	Rs 3 "

v) Similarly it would be imperative that necessary infrastructure is created to sustain the transportation of the additional production envisaged. The Survey suggests an outlay of Rs 10.0 million in this regard, for laying of feeder roads and ropeways and development of necessary port facilities.

Investment Requirements of Processing Industry. The Survey has estimated that a total investment of Rs 110 million would be required for developing the fruit and vegetable processing industry in India; major components are shown below:

i)	Assistance to existing units	- Rs 15 million
ii)	Setting up of new processing units	- Rs 10 "
iii)	Development of ancillary industries	- Rs 15b "

i) The processing sector of this industry would require considerable amount of improvement before it can undertake any sizable export effort. With a view to improving the competitive efficiency of this sector, the Survey recommends that 10 units should be selected for intensive development for export production. These units should be provided with assistance for rationalising and modernising their machinery and equipment. Where necessary, assistance should also be extended for expansion of existing capacity. Total investment on this account would be about 15 million. This is a short-term measure and requires early implementation for coping with expanded output of fruits and vegetables envisaged earlier.

ii) The sizable programme of development of the processing sector envisages establishment of units in major production centres capable of sustaining such units. It is thought that setting up of processing units in production centres would lead to an integrated development of the industry. With this idea in view, the Survey recommends the setting up of the following processing units, with investment requirements as shown alongside:

a) 2 Mandarin Orange Segments Units - Rs 20 million
b) 1 Pineapple Products Unit - Rs 25 million
c) 1 Citrus Concentrates Unit - Rs 10 million
d) 2 Deciduous Fruits Units (Peaches, Pears, Apricots etc.) - Rs 10 million
e) 2 Tomato Products Units - Rs 15 million

iii) The Survey recommends a built-in provision for development of auxillary industries like packaging and machinery manufacture. The investment in this regard would amount to about Rs 15 million.

Export Effort. In order to tap effectively the export potential of India's fresh and processed fruits and vegetables, the Survey recommends an investment of Rs 40 million on promotional and related measures. These include: (i) trial shipments; (ii) product testing and test marketing; (iii) consumer surveys; (iv) opening of overseas offices; (v) comprehensive programme of publicity and promotion in overseas markets.

Foreign Investment. Taking into account the scarcity of local finance and limited resources of foreign exchange available, there is much to be said in favour of inviting foreign capital, which brings along with it latest machinery and know-how, for the development of processing industry in the country. The instances offered by Philippines

(American investment), Ivory Coast and Martinique (French investment) and Kenya and Ethiopia (German investment) are of great relevance in this context. Industry in these countries has been developed primarily to service respective domestic markets of the principals whose consumption potential is very high.

The Government should consider offering specific inducements to prospective foreign investors, such as removal of inhibitions like the liberal interpretation of the present Land Ceiling Act, simplification of procedures and availability of facilities for repatriation of profits in the interests of horticultural development for export.

3.19 IMPLEMENTATION OF RECOMMENDATIONS

Considering the natural advantages enjoyed by India in producing a wide range of fruits and vegetables and the enormous export potential available in the world markets, it is but natural that India should seriously consider devoting attention to the development of a sound and viable export oriented horticultural industry in the country. It has been suggested earlier that certain short and medium terms measures, entailing an investment of ₨ 400 million over a period of five years would lead to a sizable increase of India's exports of fresh and processed fruits and vegetables.

It must be stressed, however, that these measures constitute but a minimal programme when viewed against the immense scope that exists for development and exports. The measures recommended in the Report are considered as the minimum effort required to be undertaken by the end of the 4th Five Year Plan. It is suggested that the Planning Commission should set up a high-powered Committee comprising representatives of the Union Ministries of Food & Agriculture, Industry Commerce and Finance, with the association of selected horticultural experts from the States, for considering the recommendations embodied in this Report with a view to determining the priorities and effecting implementation.

It will be appropriate that for taking a long look ahead over the ten year period of the 5th and 6th Plans, a Horticultural Production and Expots Commission should be constituted for drawing up a bold and imaginate programme of development in the sector of fresh and processed fruits and vegetables with the following objectives :

i) To make an assessment of the present situation of the horticultural industry in the country and recommend measures for long term development and exports;

ii) To study in detail the technical problems concerning production, preservation and processing of horticultural crops and suggest suitable measures for improvement;

iii) To evaluate marketing methods presently obtainting in the country and recommend appropriate policies for further improvements.

ANNEXURES

Annexure A

i) INDIA'S SHARE OF FRESH FRUITS AND VEGETABLES PRODUCTION AND EXPORTS (1965)

Quantity: Thousand Tonnes
Value : Thousand Dollars

	Production			Exports					
	World	Survey Countries@	India	World		Survey Countries		India	
	Qty	Qty	Qty	Qty	Value	Qty	Value	Qty	Value
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Fruits									
Bananas	23,024	2,243	2,700	4,733	416,177	145	6,212	8	727
Citrus	23,912	5,009	1,250	12,679	541,551	1,001	212,158	240	198
Pineapples	3,516	831	76*	65*	1,300*	53	1,079	-	2*
Mangoes	8,500	700	7,000*	7*	1,000*	6	839	0.6*	114*
Grapes	54,311	28,990	130*	9,401	148,962	406	65,594	Neg	9
Apples	19,199	10,471	49*	1,985	292,565	953	127,013	Neg	105
Peaches	5,159	2,074	7*	300*	33,000*	-	-	-	-
Pears	5,214	2,358	32*	4,058	75,018	223	43,392	-	-
Avocadoes	65	14	Neg	2.5*	2,000	4	-	-	-
Vegetables									
Onions	9,598	2,021	1,102*	966	74,567	511	40,944	99	5,290
Potatoes	284,255	56,176	3,668	3,620	224,307	2,266	145,373	2	232

Contd.....

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Beans (Green)	2,384	1,021	23*	NA	NA	-	-	-	-
Pears	3,331	1,328	171*	NA	NA	-	-	-	-
Tomatoes	19,395	7,818	464*	NA	NA	-	-	Neg	0.1
Cauliflowers	2,577	1,883	413*	NA	NA	-	-	Neg	0.3
Cabbages	13,826	4,593	288*	NA	NA	-	-	-	-

@ Sources

a) Production Yearbook Volume-20, 1968, FAO, Rome
* b) Trade Yearbook Volume-20, 1966, FAO, Rome
c) IIFT Survey, 1968

Survey Countries

@ a) South East Asia: Hong Kong, Malaysia, Philippines, Singapore and Thailand

b) West Asia : Bahrain, Kuwait, Lebanon, Iraq and UAR

c) Europe : Denmark, France Greece, West Germany, Holland, Italy, Spain, Sweden, Switzerland, UK, Belgium Luxemburg and Yugoslavia

ii) INDIA'S SHARE OF PROCESSED FRUITS - PRODUCTION AND EXPORTS

(Quantity: Thousand Tonnes)

	Production		Exports	
Product	World	India	World	India
a) Peaches	900.0	0.1	400.0	-
b) Pineapples	650.0	1.5	350.0	Neg.
c) Apples	250.0	Neg.	50.0	-
d) Apricots	325.0	Neg.	80.0	-
e) Pears	290.0	0.1	70.0	-
f) Citrus	500.0	0.2	75.0	-
g) Cherries	110.0	0.1	25.0	-
h) Mangoes	3.5	2.5	0.250	0.150
i) Others (including Fruit Cocktails)	1,000.0	0.5	100.0	0.150
Fruit Juices*				
a) Citrus	500	0.2	50.0	0.02
b) Pineapples	100	0.2	5.0	0.01
c) Mango	0.8	0.5	0.7	0.7
d) Others	399.0	0.1	10.0	0.07

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*Million Gallons

Annexure B

MARKET SIZE AND PER CAPITA CONSUMPTION OF FRESH AND PROCESSED FRUITS AND VEGETABLES OF SURVEY COUNTRIES DURING 1964-66

(Thousand Tonnes)

A. FRESH FRUITS AND VEGETABLES

Country	Fruits					Vegetables				
	Production	Imports	Exports	Apparent Consumption	Per Capita Consumption (Kg)	Production	Imports	Exports	Apparent Consumption	Per Capita Consumption (Kg)
France	2,783	1,568	287	4,064	83	15,191	813	652	15,352	309
West Germany	2,409	2,933	14	5,328	92	17,264	2,147	37	19,374	321
Italy	9,490	210	1,730	7,970	153	13,630	320	680	13,270	253
Netherlands	591	386	144	833	67	1,457	175	820	812	65
Belgium-Luxemburg	316	337	78	575	58	2,354	386	351	2,389	243
United Kingdom	770	1,436	12	2,194	41	10,133	1,027	174	10,986	203
Spain	4,248	1	1,590	2,659	84	2,698	252	488	2,462	77
Switzerland	587	334	10	911	149	1,495	170	43	1,622	272
Sweden	305	296	6	595	76	1,715	154	11	1,858	238
Denmark	109	125	12	222	44	1,213	28	322	919	184
Greece	1,133	9	217	925	108	1,586	18	17	1,587	185
Yugoslavia	2,672	91	41	2,722	136	4,332	18	23	4,327	216
Lebanon	506	5	203	308	124	226	20	94	152	63
UAR	2,126	-	15	2,111	70	3,391	19	263	3,147	105
Iraq	100	32	6	126	15	260	91	-	351	42
Kuwait	-	51	Neg	51	10	Neg	50	Neg	50	10
Bahrain@	-	15	-	15	83					
Thailand	1,700	-	10	1,690	57	800	4	74	730	23
Philippines	1,277	15	3	1,289	43	973	2	-	975	32
Hong Kong	-	184	22	162	41	65	285	126	224	56
Singapore	4	145	21	128	67	41	93	46	88	46
Malaysia@	1,000	109	111	998	105	-	-	-	-	-

@ includes fresh fruits and vegetables

B. PROCESSED FRUITS AND VEGETABLES

(Thousand Tonnes)

Country	Fruits					Vegetables				
	Production	Imports	Exports	Apparent Consumption	Per Capita Consumption (Kg)	Production	Imports	Exports	Apparent Consumption	Per Capita Consumption (Kg)
France	270	103	57	316	6	595	18	63	550	11
West Germany	533	368	12	889	16	529	218	4	743	13
Italy	274	13	48	169	3	518	11	230	299	6
Netherlands	182	82	48	216	16	172	38	77	133	10
Belgium-Luxemburg	35	49	14	70	7	93	43	70	66	7
United Kingdom	95	511	17	589	11	674	185	19	840	15
Spain	231	3	33	201	6	193	5	91	107	3
Switzerland	60	22	3	79	13	70	30	7	93	16
Sweden	75	40	2	113	19	102	11	1	112	19
Denmark	34	29	9	54	11	31	35	4	62	13
Greece	47	-	29	18	2	20	1	16	5	Neg
Yugoslavia	200	2	32	170	9	63	3	10	56	3
Lebanon@	30	-	6	24	11					
UAR@	20	1	7	14	1					
Iraq	Neg	1	-	1	Neg	Neg	11	-	11	1
Kuwait	-	4	-	4	8	-	10	-	10	20
Bahrain@	-	2	Neg	2	9					
Thailand@	50	2	1	51	2					
Philippines	90	2	40	52	2	17	2	-	19	1
Hong Kong	20	14	5	29	7	15	46	18	43	11
Singapore@	40	71	79	32	17	-	-	-	-	-
Malaysia@	60	18	57	21	2	-	-	-	-	-

@includes processed fruits and vegetables

Sources: Trade Accounts of Survey Countries

Annexure C

BASIC STATISTICS OF SELECTED SUPPLYING COUNTRIES OF FRUITS AND VEGETABLES

		ISRAEL	SPAIN	ITALY	FRANCE	INDIA
Total Area (Sq Km.)		20,260	504,750	301,054	551,208	2,960,000
Total Cultivated Area (Million Hectares)		0.43	16.2	15.4	55.1	138
Population (Million)		2.63	31.3	52	49.5	500
Total Exports (US $ Million)		502[+]	828[@]	8,097	10,700	1,558[b/]
Exports of Fresh & Processed Fruits and Vegetables	($ Million)	100[+]	243[@]	411	188[@]	9[b/]
Fresh	($ Million)	75	160	329[+]	116[@]	6.5[b/]
Processed	($ Million)	25	83	82[+]	72[@]	2.5[b/]
Total Imports	($ Million)	839[+]	2,574[@]	8,640[+]	11,200[@]	2,710[b/]

[+] 1966

[@] 1965

[b/] 1967-68

Annexure D

FIELD YIELDS OF SELECTED HORTICULTURAL COMMODITIES OF INDIA

Commodity	Production (Tonnes per hectare)	
	1967-68	1975-76
Bananas	25	30
Mangoes	9	10
Oranges (Mosambi, Malta, Washington Navel etc.)	11	15
Mandarin	-	15
Limes	12	15
Lychees	6	8
Grapes	10	12
Strawberries	10	25
Melons	-	20
Pineapples	15	45
Apples	7	15
Peaches	7	10
Apricots	-	15
Pears	-	15
Papaya	30	35
Onion	9	20
Tomatoes	10	25
Potatoes	7	15

Source: Survey Estimates

Annexure E

Ceilings on Agricultural Holdings*

State/Union Territory	Level of Ceiling (Individuals/Hindu undivided (family)	Remarks
Andhra Pradesh	4½ times the family holding i.e. 27 to 324 acres. (A family holding varies from 6 acres of wet land bearing settlement taram No. I or settlement classification of 15 annas and above to 72 acres of dry lands with taram above 5 and chalka soil with assessment below 8 annas).	Allowance made for size of family-additional one family holding for every member in excess of five. There is no outside limit.
Assam	50 acres	No allowance for size family.
Bihar	(a) Land irrigated by flow irrigation work constructed and maintained by Government: 20 acres	Allowance made for size of family subject to an outside limit of twice the ceiling area.
	(b) Land irrigated by lift irrigation work or tube well constructed or maintained by Government: 30 acres.	
	(c) Land which is orchard and other lands not included in any other category: 40 acres.	
	(d) Diara land : 50 acres.	

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* Ceilings applicable is existing holdings and future acquisitions are the same, except in the case of Andhra Pradesh, where the ceilings applicable to future acquisitions are as follows:

Andhra Pradesh - 18 to 216 acres (3 family holdings)
Mysore - 18 to 144 acres

State/Union Territory	Level of Ceiling (Individuals/Hindu undivided (family)	Remarks
	(e) Hilly, sandy and other lands not yielding paddy, rabi or cash crop : 60 acres.	
Gujarat	(i) Dry crop land (including land irrigated from non-Government sources): 56 to 132 acres.	No allowance for size of family
	(ii) Rice land and seasonally irrigated land 38 to 88 acres.	
	(iii) Perennially irrigated land: 19 to 44 acres.	
	(The ceiling varies in different local areas as specified in the Act).	
Jammu and Kashmir	22¾ acres	No allowance for size of family.
Kerala	12 acres of double-crop paddy land or equivalent area (equivalent areas vary between 15 to 36 acres).	Allowance made for size of family subject to an outside limit of 20 acres of double-crop paddy land or its equivalent area. For an unmarried adult person the ceiling limit would be 12 standard acres.
Madhya Pradesh	25 standard acres (a standard acre means one acre of perennially irrigated land or 2 acres of seasonally irrigated land or 3 acres of dry land).	Allowance made for size of family subject to an outside limit of 50 standard acres.

State/Union Territory	Level of Ceiling (Individuals/Hindu undivided (family)	Remarks
Madras	30 standard acres. A standard acre means an acre of land assessed to land revenue exceeding Rs. 10 but not exceeding Rs 15. In terms of ordinary acres the ceiling varies from 24 to 120 acres.	Allowance made for size of family-additional 5 standard acres for each member in excess of five subject to an outside limit of 60 standard acres.
Maharashtra	(i) Perennially irrigated land by flow irrigation : 18 acres.	Allowance made for size of family subject to an outside limit of twice the ceiling area.
	(ii) Seasonally irrigated land by flow irrigation- (a) irrigated for two seasons : 27 (b) irrigated for one season : 48 acres.	
	(iii) Dry lands (including lands irrigated from non-Governmental sources): 66 to 126 acres in different local areas.	
Mysore	27 standard acres (standard acre varies from one acre of wet land with assured irrigation on which two paddy crops can be raised to 8 acres of dry or garden land with less than 25 inches of annual rainfall).	Allowance made for the family at six standard acres per member subject to outside limit of twice the ceiling area.

State/Union Territory	Level of Ceiling (Individuals/Hindu undivided (family)	Remarks
Orissa	20 standard acres (standard acre varies from one acre of perennially irrigated land which is assured of water supply for at least three crops in a year to 4 acres of dry land).	No allowance made for size of family-
Punjab :		
Punjab area	30 standard acres not exceeding 60 ordinary acres. In case of displaced persons, 50 standard acres not exceeding 100 ordinary acres.	No allowance for size of family.
Pepsu area	30 standard acres not exceeding 80 ordinary acres. In case of displaced persons, 40 standard acres not exceeding 100 ordinary acres. (standard acre means an acre of land yielding between 10 and 11 maunds of wheat per acre matured).	No allowance for size of family.
Rajasthan	30 standard acres (standard acre means land yielding 10 maunds of wheat or in case of lands not producing wheat, its equivalent in money value).	Allowance made for size family subject to an outside limit of 60 standard acres.
Uttar Pradesh	40 acres of fair quality land (an acre of fair quality land means an acre of land with hereditary rate of rent exceeding Rs. 6; 1½ acres with rate between Rs. 4 and Rs. 6 and 2 acres with rate at Rs. 4 per acre or less).	Allowance made at 8 acres of fair quality land for each member in excess of five, subject to an outside limit of 64 such acres.

State/Union Territory	Level of Ceiling (Individuals/Hindu undivided (family)	Remarks
West Bengal	25 acres	No allowance for size of family.
Delhi	30 standard acres (standard acre varies from 4/5th of an acre of irrigated land to 2 acres of Barani land)	Allowance made for size of family subject to an outside limit of 60 standard acres.
Himachal Pradesh	30 acres in district Chamba and land assessed to Rs. 125 in other districts.	No allowance made for size of family.
Manipur	25 acres	Allowance made for size of family subject to an outside limit of 50 acres
Tripura	25 standard acres (standard acre varies from one acre of nal or lunga land to 3 acres of tilla land).	Allowance made for size of family subject to an outside limit of 50 standard acres.

Source: Progress of Land Reform, Government of India, Planning Commission, 1963

CEILING ON LAND HOLDINGS-EXEMPTIONS

1. Andhra Pradesh Ceiling on Agricultural Holdings Act, 1961
   - (i) Sugar cane farms maintained and operated by a sugar factory.
   - (ii) Land held by religious, charitable and educational institutions.
   - (iii) Co-operative farming society approved by Government and lands granted by Government to a co-operative society.
   - (iv) Land covered by tea, coffee or rubber plantations.
   - (v) Land on which orchards are raised.
   - (vi) Land of specialised farms engaged in cattle breeding, dairying, wool-raising etc.
   - (vii) Efficiently managed farms consisting of compact blocks on which heavy investment structural improvements have been made and whose break-up is likely to lead to a fall in production.
   - (viii) Land awarded for gallantry.
2. Assam Fixation of Ceiling on Land Holdings Act, 1956
   - (i) Orchard lands upto 10 acres, in addition to ceiling limit.
   - (ii) Lands held for special cultivation of tea or purposes ancillary thereto.
   - (iii) Lands exceeding 50 acres utilised for large scale cultivation of citrus in a compact block by any person before January 1, 1955.
   - (iv) Lands utilised by efficiently managed farms on which heavy investment or permanent structural improvements have been made and whose break-up is likely to lead to a fall in production.
   - (v) Lands held by a sugar factory or a cooperative farming society for cultivation of sugarcane for the purpose of sugar factory.
   - (vi) Co-operative farming society subject to the condition that members do not hold more than ceiling limit.
3. Bihar Land Reforms (Fixation of Ceiling Area and Acquisition of Surplus Lands) Act, 1961

(i) lac-brood farms operated by the Indian Lac Cess Committee constituted under section 4 of the Indian Lac Cess Act, 1930 (24 of 1930);

(ii) land held on the date of commencement of this Act by educational institutions, hospitals, maternity homes and orphanages;

(iii) such extent of land held by such public or charitable bodies other than religious institutions, as may be notified by the State Government in this behalf;

(iv) tea plantations including such other area for ancillary purposes and development thereof as may be determinedby the Collector of the district in the prescribed manner;

(v) land required in connection with any other non-agricultural or industrial purpose ot the extent approved by Government;

(vi) any land awarded for gallantry, during the life-time of the grantee;

(vii) sugarcane farms owned and operated on the date of commencement of this Act by sugar factories; and

(viii) land not exceeding two hundred and forty acres of class III land or equivalent area of other classes owned and held under personal cultivation by any religious institution of a public nature on the date of commencement of this Act.

4. Gujarat Agricultural Lands Ceiling Lands Acts, 1960

(i) Lands held in compact blocks of efficiently managed farms on which heavy investments or permanent structural improvements have been made and breaking of which will lead to a fall in production.

(ii) Lands leased to or held by bodies or persons for growing fruit trees and used for that purpose for not less than the last 3 years;

(iii) Lands held or leased by approved Land Mortgaged Banks

(iv) Lands held or leased by approved co-operative societies for improvement of economic and social conditions of peasants or for ensuring the full and efficient use of land;

(v) Lands leased or held by approved industrial undertaking which bona fide carries on any industrial operations;

(vi) Lands being the property of a public trust for an educational purpose, hospital, Pinjrapole, Gaushala or an institution for public religious worship the entire income from which is for the purpose of the trust.

The lands in the categories mentioned above will be taken into account in computing the ceiling area of a person, but if the extent of land held under such categories exceeds the ceiling area, the person will not be permitted to retain other lands.

5. Jammu & Kashmir Big Landed Estates Abolition Act, 1950

(i) Kah krisham areas (lands growing grass of krisham variety), arakas (fuel plantations), kaps (grass lands) and such lands including those used for raising fuel or fodder, as are unculturable.

(ii) Orchards.

(iii) Any land owned by a co-operative society registered under the Co-operative Societies Act.

6. Kerala Land Reform Act, 1960

(i) Plantations of tea, coffee, rubber or cardamom or such other kind of special crops as may be specified by the Government. A planter would, in addition, be permitted to retail lands:-

(a) used by such person for any purpose ancillary to the cultivation of such crops; or for preparation of the same for the market;

(b) lands lying contiguous to the plantation for the expansion of plantation subject to a limit of 20% of its area;

(c) agricultural lands interspersed and required for preservation and efficient management of the existing plantation if and to the extent considered necessary by the State Government;

(ii) Cashewnut plantations of 10 acres or more held in a compact block existing from before the 11th April 1957. In that case other lands to be retained by a holder of cashewnut plantation are not to exceed one-half of the ceiling area.

(iii) Lands owned or held by a regious, charitable or educational institution of a public nature.

(iv) Lands granted to defence personnel for gallantry, for the duration of their life-time.

(v) Lands put to special use which the State Government consider necessary to exempt.

7. Madhya Pradesh Ceiling on Agricultural Holding Act, 1960

(i) Land held by a religious, charitable or educational institutions.

(ii) Land held by industrial or commerical undertaking approved by Government.

(iii) Land held for tea or coffee plantation or for purposes ancillary thereto.

(iv) Sugar-cane farms operated by sugar factories.

(v) Land used for orchard or mango groves upto 30 acres.

(vi) Land held by Mortgage Banks.

(vii) Land held by co-operative societies approved by Government.

(viii) Land used for specialised farms engaged in cattle breeding etc.

(ix) Land utilised by an efficiently managed farm whether mechanised or otherwise constituting compact block on which heavy investments or permanent structural improvements have been made and whose break-up is likely to lead to fall in production.

(x) Any class of land which the State Government may exempt by notification.

8. Madras Land Reforms (Ceiling on Holdings) Act, 1961

(1) Lands in any hill area;

(2) Plantation of cardamom, cinchona, coffee, rubber or tea in existence on the date of the commencement of the Act i.e., April 6, 1961 and any land interspersed among plantations or contiguous to any plantation in respect of which the Land Board hasgranted permission for the extension of plantation and for ancillary purposes not exceeding 20% of the area used for growing the plantaion.

(3) Lands converted on or before 1st July, 1959 into orchards or topes or arecanut gardens;

(4) Lands used exclusively for dairy farming or livestock breeding in respect of which the Land Board has granted permission;

(5) Any land used for the cultivation of sugarcane and in respect of which the Sugar Factory Board has granted permission;

(6) Any land held by a co-operative society, provided, however, that the share of each individual member in the lands of a co-operative Society will be taken into account in computing the ceiling area of the member;

(7) Lands held by educational institutions and universities;

(8) Any land awarded for gallantry.

(9) Gramdan and Bhoodan lands.

(10) Lands held by industrial or commercial undertaking as approved by the State Government.

(11) Lands used exclusively for growing fuel trees in existence on the date of the commencement of the Act.

9. Maharashtra Agricultural Lands (Ceiling on Holdings) Act 1961

(i) Land held by a public trust for Pinjrapole or Goshala, or for educational or medical needs.

(ii) Lands leased by Land Development Bank, or a Central Co-operative Bank or a Co-operative Society before 4-8-1959.

(iii) Lands held by regimental farms approved by Government.

(iv) Lands awarded for gallantry.

(v) Lands held for stud farms approved by Government.

(vi) Lands held by private undertakings for bona fide industrial or non-agricultural use.

There is no provision for exemption of sugarcane farms operated by a sugar factory. However, special provision has been made to ensure that the acquisition of such lands does not adversely affect the production and supply of raw material from such land to the factory.

10. Mysore Land Reforms Act, 1962

(i) Lands under cultivation of cardamom, coffee, pepper, rubber and tea plantation

(ii) Orchards where they constitute in the opinion of the State Government reasonable compact areas.

(iii) Specialised farms set apart for livestock breeding, dairying, wool raising, and other operations which are notified by the State Government.

(iv) Sugarcane farms owned by sugar factories on the appointed day.

(v) Efficiently managed farms which consist of compact blocks, on which heavy investment or permanent structural improvements have been made and whose break-up in the opinion of the Tribunal is likely to lead to a fall in production.

11. Orissa Land Reforms Act, 1961

(i) Plantations of coffee and casuarina, tea, rubber, cashewnut, sisal and such other plantation as may be notified.

(ii) Orchards used as such before the 30th March 1959.

(iii) Specialised farms engaged in cattle breeding and dairy farming.

(iv) Sugarcane farms operated by sugar factories.

(v) Efficiently managed farm consisting of a compact block on which heavy investments or permanent structural improvements have been made and whose break-up is likely to lead to a fall in production

(vi) Lands held on the specific condition of performing service of public nature or rendering service to Government.

(vii) Land held by a co-operative farming society provided no individual member holds more than ceiling area for personal cultivation.

12. Punjab Security of Land Tenures Act, 1953 (former Punjab area)

(i) Orchard or tea estate in existence at the commencement of the Act.

(ii) Co-operative garden colonies which were registered before April 15, 1953.

(iii) Well run farms as determined under the Rule. (Rules have been framed for exemption of well run farms. For purposes of exemption, each farm will be inspected and allotted marks. The aggregate marks would be 1000. Half of them would be allotted on the basis of yields. The other half would be allotted on the basis of yields. The other half would be allotted on the basis of other criteria, such as lay out, cultivation and sowing practices, use of manures, soil conservation, plant protection, development of irrigation facilities, etc.).

(iv) Lands granted to members of the armed froces of the Union for gallantry.

Pepsu Tenancy and Agricultural Lands Act, 1955

(i) Orchards where they constitute reasonably compact areas.

(ii) Specialised farms engaged in cattle breeding, dairying or wool raising.

(iii) Sugar-cane farms operated by sugar factories.

(iv) Efficiently managed farms which consist of compact blocks on which heavy investment of structural improvements have been made and whose break-up is likely to ,lead to a fall in production.

(v) Lands belonging to registered co-operative societies formed for the purpose of co-operative farming provided the land owned by an individual member of the Society does not exceed the ceiling limit.

(vi) Lands held by religious and charitable institutions.

(vii) Lands granted to members of armed forces of the Union for gallantry.

13. Rajasthan Tenancy Act, 1955 (amended in 1960)

(i) Groves constituting contiguous and compact areas;

(ii) Sugar-cane farms, operated by sugar factories;

(iii) Co-operative agricultural farms efficiently managed, provided that no member's share in any such farm or farms shall exceed the ceiling area applicable to him;

(iv) Efficiently managed specialised farms registered in the prescribed manner for cattle breeding, horse breeding, sheep breeding, wool raising and dairying; and

(v) Other efficiently managed farms which consist of compact blocks and whose break-up is likely to lead to a fall in production.

14. Uttar Pradesh Imposition of Ceiling on Land Holdings Act 1960.

(i) Grove land existing on May 1, 1959.

(ii) Land used for tea, coffee or rubber plantation or by pharmacological and such herbal and other plantations as the Government may notify.

(iii) Land held by a religious or charitable waqf, trust or endowment on May 1, 1959 or held for purposes of educational institutions.

(iv) Land acquired by any Co-operative Bank in lieu of mortgaged debt.

(v) Specialised farms and farms exclusively devoted to poultry farming, dairying, etc.

(vi) Land under cultivation of pan, keora, bela, chambeli or gulab in case the person surrenders all land under other cultivation.

15. West Bengal Estates Acquisition Act, 1953

(i) Tea gardens including land for ancillary purposes.

(ii) Orchards.

(iii) Land used for live-stock breeding, poultry farming or dairying.

(iv) Land held by religious or charitable institutions under khas possession.

(v) Co-operative farming society provided that each member does not individually hold more than ceiling area.

(vi) Land comprised in mill, factories, workshops and areas ancillary thereto.

16. Delhi Ceiling on Land Holdings Act, 1960

1. (a) Compact block of land used as an orchard farm before 10th February, 1959.

(b) Efficiently managed farm which consists of compact block on which heavy investment or permanent structural improvements have been made and whose break-up is, in the opinion of the Chief Commissioner, likely to lead to a fall in production:

Provided that where a person holds the compact block of land together with any other land, he shall be permitted to elect to retain either the compact block of land, notwithstanding that it exceeds the ceiling limit, or the other land not exceeding the ceiling limit.

2. Specialised farm, engaged in cattle breeding, dairying wool raising.
3. Land held by a body notified by the Chief Commissioner under section 33 of the Delhi Land Reforms Act, 1954.
4. Land held by a co-operative society provided, however, where a member of such society holds a share in such land his share shall be taken into account in determing his ceiling limt.

17. Himachal Pradesh Abolition of Big Landed Estates and Land Reforms Act, 1953

    (i) Highly efficiently managed farms whose break-up is likely to lead to a fall in production.

    (ii) Orchards: (The area of an orchard will be taken into consideration for determining the ceiling, but the entire orchard will be left with the landowner).

18. Manipur Land Revenue & Land Reforms Act 1960 and Tripura Land Revenue and Land Reforms Act, 1960

    (a) Land used for growing tea, coffee and rubber including ancillary and extension purposes;

    (b) Any sugarcane farm operated by a sugar factory;

    (c) Any specialised farm used for cattle breeding, dairying or wool raising;

    (d) Orchards in compact block before 1st January, 1958;

    (e) Farm in a compact block in which heavy investment or permanent structural improvements have been made and which is so efficiently managed that its break-up is likely to bring a fall in production; and

    (f) Land held by a co-operative farming society: Provided, however, where a member of such society holds a share in such land his share shall be taken into account in determing the ceiling limit.

Source: Progress of Land Reform,
Government of India,
Planning Commission, 1963

Annexure G

RESULTS OF LABORATORY TESTS CONDUCTED BY CFTRI ON THE IMPORTED PROCESSED ITEMS

PINEAPPLE SLICES

	HAWAI	MALAYSIA	CHINA	INDIA	
				Trichur	Coorg
Details on the label	Hawai, Libby's, Wt.836 g. Can size 2½, 8 slices, serve as a breakfast food or desert, use in salads and deserts. Broil or panfry. Serve as meat accompaniment. Instructions given for pineapple sandwitch salad	Malaysia, Goldpine 8 slices	China, Taicho Gross wt. 240 g. Tare 100 g. Fruit 140 g. in heavy syrup	Indian Trichur	Indian Coorg
Size of container	401 x 411 (A 2½)	301 x 309	306 x 202	401 x 411 (A 2½)	401 x 411 (A 2½)
External appearance	Normal	Normal	Normal		
Vacuum (Inches)/ Headspace	Nil/Nil	5"/1/8"	2"/Nil		
Gross wt. gm.	980	448	320		
Wt. of container gm.	135	72	65		
Net wt. of contents g.	845	376	255		
Drained wt. %	68.03	47.34			
Internal appearance of the container	Heavy feathering	Light feathering	Medium feathering	Colour:Golden yellow,	Flavour: Very good, Colour: Light golden yellow
Organoleptic quality	The product has uniform ripeness, full flavour, very uniform preparation (cutting and trimming). The core is large. Liquid fairly clear and pale yellow in colour	Fruit immature, flavour poor; too many white patches, texture fairly good; colour poor	Colour: quite attractive, white patches present, Texture fibrous, flavour:fairly good	Cutting & trimming: not very uniform as it has been prepared manually. Flavour:good	Preparations: fairly good; can be improved with mechanical cutting & coring
Total soluble solids % at 20°C	22.0	22.0	21.0	23.5	24.5

	HAWAI	MALAYSIA	CHINA	INDIA	
				Trichur	Coorg
Acidity (as anhydrous citric acid)	0.22%	0.22%	0.71%	0.33	
PH ..	4%	3.9	3.6	3.9	
Brix/Acid ratio	100	100	24	71	

FRUIT COCKTAIL

	Switzerland	U.S.A.	U.S.A.
Details on the labels	Hero, Net wt. 495 gm. The product was wrongly labelled as Fruit Cocktail instead of Canned lima beans.	Hunts', U.S.A. in heavy syrup; Net wt. 425 gm.	Sand W, Cherries artificially coloured, approx. 1 cup, packed in sucaryl, 227 gm. Price 22 prs.
Size of container:	214 x 408	215 x 406	210 x 303
Vacuum		7"	-
Head space		Nil	Nil
Gross wt.		505	275
Wt. of the container		80.0	45.0
Net wt. of contents		425	230
Drained wt. %		-	-
Internal appearance of the can		Lacquered end, normal	Normal
Organoleptic quality		Fruits a little mashy, Flavour: good	Appearance: very bad; flavour: fair; pieces cut uniformly.
Total soluble solid % at 20°C.		20.0	8.0
Acidity % as anhydrous citric acid		0.24	0.32
PH ..		4	3.8
Brix/Acid ratio		83	25

ORANGE SEGMENTS

	CHINA	JAPAN	INDIA
Details on label:	China, Maling, peeled in whole segments in light syrup, Net st. 312 gm. fruit wt. 172 gm. price 50 cents.	Japan, wet_pack, Instructions given for use, Net wt. 312 gm. Price 1.60 kr.	Not labelled
Size of container:	214 x 307	300 x 305	301 x 309
External appearance	Normal	Normal	Normal
Vacuum	Nil	Nil	-
Head Space	Nil	Nil	-
Gross wt. gm.	385	387	-
Wt. of the container gm.	65	60	-
Net wt. gm.	320	327	-
Drained wt. %	6	57	-
Internal appearance of the container	Lacquered lid. Normal	Slight feathering	Slight feathering
Organoleptic quality	Colour: Good; Appearance: Very Good; Segments are of small size	Colour: Good; Appearance: Very good; Segments are of small size	Colour: Good; Flavour: Very Good; Segments: a little larger than Japanese and not crisp as Chinese and Japanese products.
Total soluble solids	19.0	19.0	25.0
Acidity % as anhy. citric acid	0.45	0.76	0.52
PH ..	3.8	3.4	3.8
Brix/Acid ratio	42	25	48

	ORANGE JUICE		LEMON JUICE	
	U.S.A.	Lebanon	Labanon	Sicily
Details on the label	Adams, U.S.A., Unsweetened, 6 oz. 0.117 lit. 0.40 Fr.	La Fruta Lebanon 0.53 lit.	Bon Jus, no sugar added, pure 200 gm. 6 fl. oz. prepared from sun ripened lemons	Sicilemon, Sicily 6 fl. oz. 180 gm. No preservative added.
Size of container	202 x 314	306 x 408	202 x 312	202 x 312
External appearance	Normal	Normal	Normal	Normal
Vacuum (Inches)	Nil	9	Nil	6
Headspace	Nil	Nil	Nil	Nil
Gross wt. gm.	220	685	220	225
Wt. of the container gm.	35	95	40	40
Net wt. of contents gm.	185	590	180	185
Internal appearance	Heavy feathering	Lacquered normal	Lacquered normal	Lacquered normal
Organoleptic quality	Flavour: Fairly good, unsweetned	Appearance: Good Flavour: Poor Bitterness is excess	Flavour: Good Colour: Slightly brown	Flavour: Good Colour: Brown Slightly more
Total soluble solids at 20°C	14.0	15.0	10.0	10.0
Acidity % as anhydrous citric acid	0.83	0.71	5.63	4.94
PH	3.9	3.2	2.4	2.6
Brix/Acid ratio	17	21	-	-

	PINEAPPLE JUICE		GRAPE FRUIT JUICE	
	Hawai	Philippines	Spain	Florida (Cypress origin)
Details on the label	Libby's, single service 1 cup 185 gm. unsweetened	Del Monte, Philippines 2 to 3 servings, 12½ fluid oz. natural PAS 840	Veda, Spain, Net wt. 200 gm. sweetened	Cypress Gardens Unsweetened 60 z.0.117 lit.
Size of the container	202 x 314	210 x 402	204 x 313	202 x 313
External appearance	Normal	Normal	Normal	Normal
Vacuum (Inches)	7	Nil	Nil	7
Headspace	Nil	Nil	Nil	Nil
Gross wt. gm.	235	445	260	220
Wt. of the container g.	45	75	55	40
Net wt. of container/ contents	190	370	205	180
Internal appearance of the can	Light corrosion	Light corrosion	Heavy feathering	Light feathering
Organoleptic quality	Colour: Light yellow, good, Flavour: fairly good	Colour slightly brownish yellow Flavour: Poor	Colour: Very good Flavour: Very good	Colour: Good Flavour: Good
Total soluble solids at 20°C	13.5	10.0	15.0	10
Acidity % as anhydrous citric acid	0.69	0.59	1.15	1.14
PH	3.8	4.0	3.2	3.6
Brix/acid ratio	20	17	13	9

PACKING STATIONS AND METHODS OF PACKING*

Introduction

Mass production and the development of modern methods of trade made it necessary to attempt to find outlets much further away and therefore it was also necessary to prolong the durability of the produce, i.e. by improved methods of transport and of packing. As long as the growerddid the packing himself it was the rule that identical products packed in different, and often strange looking containers could be seen at a market. The rise of big wholesale concerns and in particular the development of co-operatives were the beginning of the search for means to introduce more uniformity with the aim of arriving at a decrease of costs and to evolve possibilities to increase the sales by offering bigger packs of uniform quality. This has led to the development of modern packing stations, which are usually established near the growing areas.

The Packing Station

The task of a Packing Station is a multiple one and can be subdivided as follows:

i) Assembly of Supplies. To ensure adequate supplies of a well graded and well packed commodity the packing Station must be able to attract the growers to deliver their supplies for handling. Particularly small and medium size farms, producing rather small supplies are more or less committed to sell the produce through the intermediary of a Packing Station if they are to avail themselves of the markets where the best prices are paid.

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*The Handling and Marketing of Fruit and Vegetables at the Growers-Shippers level, The Hague, 1954.

ii) Grading. The ungraded produce will have to be graded on the size and quality according to preconceived standards under fixed names and packs, in attractive, rigid containers, easy to handle.

iii) Durability. The packing station will have to adopt means to prolong the durability of the produce (harvested due to their nature within a very short season), in order to spread the possibilities of sale over a longer period. In doing so slumps in the market can be averted.

iv) Market Information. Though it must be admitted at once that market-analysis is primarily a task of the trade, it cannot be denied that the management of a packing station will have to keep itself well informed of the requirements of the final purchasers as to the produce itself and its packing. But the management will not operate on that market actively as this is a task exclusively reserved for the trade. It will, however, be essential that management go deeply into the problems of the possibilities of sale provided by the trade.

The Building

The following departments are essential in any Packing Station:

i) A Reception Hall. This hall must be suitable equipped to receive the produce of growers and at least be of a size that twice the quantity of supplies can be piled up there as is represented by the capacity of the grading and packing hall. If it is the intention to use the hall also for storing room in the autumn, it will be necessary of course to make it still bigger. It should not be overlooked, however, that this hall is only fully occupied for a short period (a few months).

The reception hall should not be too high and should be protected against wide fluctuations in temperature. A hall insulated against frost in winter that can be refrigerated in summer would be ideal.

A smooth floor is a primary consideration for internal transport. It must be well lighted but no special requirements have to be met in this respects.

A proper communication in the cool store and the grading and packing hall is essential, and the accomodation must make it possible to unload under all weather conditions and to divide the work over various platforms (platforms with doors on all sides).

ii) Packing and Grading Hall. The size of this hall will mainly depend on the working scheme adopted. There is a tendency to make this hall too large, but it should not be overlooked that with a width or length of a few metres more unnecessary transport and therefore extra costs are involved.

The hall must be well lighted, but care should be taken that the rays of the sun do not cause overheating. The best solution is to construct so called shed roofs facing north with a moderate artificial lighting system, supplying adequate light to the machines and packing tables. The light should not be annoying and not cause any discoloration.

In countries where low temperatures prevail during winter, a good heating system will be needed.

A choice can be made here between a general heating system or radiated heat. The latter is preferred as with that system heat is supplied at those places where it is most wanted and the fruit will not be adversely affected. Equally important is a proper ventilation, both in the interest of the staff and of the fruit. In order to facilitate a proper supervision, a "walking or control platform" should be erected from which the management can overlook the whole hall. This section should be made draughtproof (rubber doors and shutters).

iii) Reception hall for empties. This hall is intended for the storage and supply of empties and should be erected at a site with an easy access to the packing and grading hall. Two possibilities are open here viz. access either from above or from below. Both systems are applied with equal success.

Supply from above has the advantage that a mechanically driven conveyor can be used to take the empties up, the distribution over the machines being accomplished with roller conveyors moved by gravity. In the other case the stock can be replenished with a roller oonveyor but several mechanical conveyors will be needed to supply the machines with empties. The available room must be adequate to store supplies of empties for a considerable time. Moistness must be averted by all means and the communications with the discharge tracks must be kept open and take the shortest routes.

iv) Discharge of Empty Containers. If the containers (growers) after being emptied are not to be used again, they should be removed expediously. A common sight in packing stations are troublesome piles of all kinds of empty containers. A proper store, either under the floor or at a short distance in communication with the packing hall by a conveyor, will be the solution here.

Its size can be decided upon according to whether the store will be used temporarily or permanently.

v) Despatch Hall. The despatch hall should be erected beyond the packing and grading hall. Here again a smooth floor is required and platforms should be available, a square room accessible by doors on all sides is the most practical proposition as in this case the conveyors can be reduced to the shortest possible length. There must be facilities to keep various loots and grades separate from each other. The measurements will for that reason be usually a little larger than those of the reception hall. If the principle that all lots not being dispatched will be immediately stored in the cool store is adhered to, the measurements of the dispatch hall can be modified accordingly. Good lighting, proper ventilation and temperature are required.

vi) Office, Cloak room and Lavatory and Canteen. A suitable room, well lighted and accessible from all sides must be available for office accomodation. It is of importance that all the work in the station can be watched from there. In general such a room should not be over-large but it is essential that the office staff can do their work in a quiet atmosphere. It is also important that proper facilities are available as regards cloak rooms, lavatories, toilets, etc. In order to further good relations with the members of the staff and encourage their work, the accomodation should be made as attractive as possible, without overdoing it. A canteen, comfortably, but simply equipped makes the best impression both to the staff and to outsiders.

vii) The Cold Store. A packing station without a cool store is not a business proposition. The quality of our products is very much affected by conditions of temperature and weather, and therefore facilities for storage in cooled rooms should be available at any time. Apart from this it is desirable to have always a stock of saleable produce available to censure a smooth run of the business and to avoid exhaustion of stock. Also pre-cooling before transport has proved to be a matter of importance. Proper communications between the receiption and dispatch halls of the packing station are essential to ensure a quick throughput of the produce.

The Equipment and Internal Transport

i) Graders. The various types of graders can be classified in two groups.

1. Graders sizing according to weight.
2. Graders based on the principle of diverging belts (Janssen grader, Westfriesland, Wovebi).

The requirements a good grader could be summarized as follows:

1. A grader should cause a minimum amount of damage.
2. The capacity must be so that congestion of fruit-supplies is avoided.

3. The graders must be equipped so that at least three qualities and five sizes can be made.
4. They must be constructed so that the attending staff has to do as little work as possible to complete the operations required.

ii) Packing Tables. If the fruit cannot be packed directly from the bins or trayes, a packing table will have to be provided for the packers from which they pack the graded fruit in boxes, either wrapped or not. Special attention should be paid here to their installation with regard to the comfort of the packers. Any operations requiring more effort than is actually needed, will have an adverse effect on the efficient utilisation of labour. The place of the wrapper trys must be well defined in advance and the supply and removal of boxes must be arranged in such a way that as little labour as possible is required for it. This can be achieved by installation of roller or belt conveyors. Good light is essential near the tables.

iii) Lidding and wiring machines. Any packing station of some size will have to instal automatic lidders. Several machines are available for lidding. Also wires can be put round the cases mechanically.

iv) Internal transport. The internal transport in a packing house should be adjusted to the requirements set by the cork scheme of the concern. The unloading of lifters or hoist trucks. Both systems can be applied simultaneously. For smaller stations catchlifters, is recommended as hoist trucks require wide driving paths. In the grading room a different system will have to be applied. Where the same route is followed regularly roller or belt conveyors can be used. If the direction of transport is varying catch lifters must be preferred. If possible transport for the supply and removal of empties should be through the air or underground. In the case of transport over long distances a chain conveyor may render useful services. It is very difficult to give general rules for every separate case. The work scheme applied plays a prominent part here.

Transport in a vertical direction can be accomplished by using fork lift trucks and elevators. The former are commonly used in cool stores. The transport between cool store and packing station can most economically be maintained by catch lifters.

Work Schemes

The work scheme to be adopted depends mainly on two factors: the compositoin the supplies, that is qualitatively and in respect of the number of varieties and kinds and in the second place the system of selling.

If the average quality is only poor the instructions given for grading will differ from those given for supplies of one variety of a good quality.

If the separate lots arriving are relatively small it will be necessary to pool several lots in order to avoid high costs of labour.

As a rule it must be assumed that the result of grading of the lots of various suppliers have to be recorded separately. It is best however, to use the grader as long as possible for the same variety as otherwise the gadgets for measurements will have to be altered too often.

The fruit not suitable to be packed is directly conveyed to the despatch-hall by conveyors.

The methods of packing vary in this respect that in the Netherlands the fruit is not always wrapped, but often diagonally packed so that the apples and pears are put unwrapped in diagonally arranged layers, protected by intermediate sheets of corrugated paper or tissuepaper with wood wool in between.

This way of packing is cheaper than wrapping ans is particularly suitable for inland transport and transport within Europe. There are only two methods of packing by which damages are reduced to a minumum, viz. the so called American wrapping methods and the so called egg-tray-pack, frequently applied in Great Britain and Sweden. The American wrapping method is too well known. With the egg-tray-pack sheets of fibre with cups of the shape of apples pressed in are used. Damage is absolutely out of the question here but this methods is rather costly.

Staff

A very important item in running a packing station is the appointment of staff. In the first place an adequate staff should be available without pushing the costs up too far. In the second place proper training should be provided for. It is of paramount importance that any packing station should engage one or more instructors who are able to teach the staff which changes, almost every Year, the knacks and vocational knowledge required in as short a time as possible.

Grading and packing are very "labour intensive" operations. Not only the ordinary graders and packers will have to go through a proper training, but in particular also the directing staff, and those who know all the technical knacks of the job who nevertheless are no good as organisers. A good manager will see to it that by specialisation and proper precautions congestion is avoided as much as possible and he will give the right instructions to his assistants to achieve this.

It would be of great importance if this matter was paid proper attention to also internationally. It would be develop uniform working schemes for the various machines and to show with photographs and films how the work should be done. In particular the separate operations, as for instance the way an apple should be picked up or a pear should be wrapped most efficiently according to the opinion of the exports would have to be demonstrated in an attractive manner.

Of great interest are the social provisions of behalf of the workers. Proper social facilities produce favourable labour conditions. Workers are usually not oppossd to hard work and long hours, if the conditions under which they work are made as agreeable as possible. A good feeling amongst the staff should be stimulated. The management should be prepared to listen to wishes and complaints, provided they are well founded, and should see that suggestions apt to simplify or improve the outturn are freely made.

The cost of wages and social charges represents by far the larger part of all expenditure, to be accounted for in the calculation of the tariffs to be charged. 50 to 60 per cent of the costs of handling in the packing station accrue from this cost. Depareciations and interests based on a life for the building of 25 years and for the machinery of 10 years will represent about 20 per cent of the total costs. Maintenance, heating and supply of power will amount to 10 per cent of all expenditure. The rest is overhead costs ensuing from items as administration, supervision, control, managements, etc.

This shows once more how labour intensive the management of a packing station is and of how much value is an efficient work-method.

It is to be emphasised here that the costs set out above do not include the cost of materials needed as the cost of these many may be different in each country and will vary according to the requirements the packing has to comply with.

Inshort, the following considerations should govern the setting up of packing houses.

1. When standardization of packing of vegetables and fruit is aimed at, packing stations are essential.
2. The task delegated to these packing stations should not only be stable but also dynamic, that is, they have to adapt themselves regularly to the requirements of the markets and have to adjust their activities accordingly, without attempting to exert an active influence on these markets which is the task of the trade.
3. To accomplish this task a packing station must have

the use of suitably equipped buildings.

4. Aproper training of staff is one of the primary conditions in applying an efficient work scheme.

5. In the light of what has been already stated, the following items may be of interests to international co-operation:

   a) There should be standard designs for a packing station of the smallest size. A "standard" packing station should be equipped in such a way that, whatever its site, it will serve a useful purpose. Particularly in under-developed countries great advantage could be taken of such design.

   b) It would be an advantage to aim at the design of a standard pack adapted to European conditions. The means of converyance could be adjusted to such a pack, containers could be designed, adapted to these measurements, and international models of pallets, hoist trucks, etc. could be designed accourdingly. Enormous amounts could be saved in costs in the future. If such packs could not be statutorily prescribed, it might be possible to introduce them by mutual agreement between the packing stations.

   c) Standard instruction should be laid down for manipulations and operations performed in any packing station. The preparation of instructive films, exchange of practical experience etc. should be recommended.

d) Mutually agreed requirements of grading and an uniform internation of them seem essential. This is by no means a new proposal but experience has taught that when certain agreements have been made, the interpretations of the clauses often differ so much that all uniformity gets lost. If we want to achieve something on a European basis it will be essential in the first place to agree upon the foundation on which the structure will be built. Here joint consultation between the executive agencies, that is, the packing stations, will be indispensible.

Annexure I

TINPLATE REQUIREMENTS OF INDIA'S HORTICULTURAL EXPORTS BY 1970-71 AND 1975-76

(Tonnes)

Product Group	1970-71	1975-76
Canned Fruits	200	15,500
Mango Juice/Nectar	1,600	4,000
Other Juices/Nectars	280	2,800
Tomato Concentrates	25	2,500
Other Concentrates and Pulps	85	1,700
Canned Vegetables	160	2,000
Others	150	1,500
Total	2,500	30,000

Source: Survey Estimates

Annexure J

ESTIMATES OF INITIAL EXPENDITURE ON PRODUCT TESTING, TEST MARKETING AND SALES PROMOTION

(Dollars)

Country	Produt Testing and Tesk Marketing		Sale Promotion	
	Fresh Items	Processed Items	Fresh Items	Processed Items
France	5,000	10,000	10,000	15,000
West Germany	-	10,000	5,000	20,000
Italy	-	-	-	5,000
Netherlands	-	5,000	5,000	5,000
Belgium-Luxemburg	-	-	5,000	10,000
UK	5,000	5,000	10,000	10,000
Switzerland	-	5,000	8,000	10,000
Sweden		10,000	5,000	10,000
Denmark	-	5,000	-	5,000
Singapore		-	3,000	5,000
Malaysia	-	-	3,000	5,000
Hong Kong	-	-	3,000	5,000
Kuwait	-	-	3,000	5,000
Total	10,000	50,000	60,000	110,000

Source: Survey Estimates

Annexure K

SALIENT FEATURES OF THE WORK DONE BY INDIAN AGRICULTURAL RESEARCH INSTITUTE ON HORTICULTURAL COMMODITIES

I FRUITS

1. Mango

Performance. The variety Neelum is behaving as a dwarf and regular-bearing variety under Delhi conditions. Out of the commercial varieties of this region the variety Dussehri has been found to be the best performer.

Sex ration. In the Dussehri variety the percentage of perfect flowers in the panicles of the late flush was 7 times more than that of the early flush. Initial fruit set was almost 12 times more in the late emerged panicles in the Dussehri variety can be made more productive if flowering could be delayed. In another experiment on a shy-bearing variety of mango (Baneshan), Naphthaleneacetic acid sprays (200 parts per million) resulted in three-fold increase in the percentage of perfect flowers, six-fold increase in the initial fruit set and almost 2½ times increase in the ultimate fruit retention, as compared with the control. This finding is of practical importance in obtaining increased yield in shy-bearing mango varieties of South India.

Self incompatibility. Detailed studies in the varieties Dussehri, Langra, Chausa and Bombay Green have established the existence of self-incompatibility. This finding will be of direct help to the mango breeder in quickening the pace of evolving hybrids in large numbers. It highlights the necessity of finding out suitable pollinisers for these varieties to obtain higher yields.

Hybridization. With a view to evolving a good quality regular-bearing variety of mango 17,376 flowers have been crossed using a number of suitable parental combinations. These have yielded 295 hybrid seedlings. Some of these seedlings have fruited within 3 to 4 years of planting in the field and hold out great promise both from the point of view of fruit quality and regular bearing. Selection of promising types is in progress.

Propagation. The technique of Veneer grafting has been standardized. This is a cheaper and more convenient method of plant propagation and can easily replace the costlier and more cumbersome method of "inarching". Moreover, this provides the easiest method of converting old inferior seedling trees into more productive ones of desired commercial variety through top-working. Such trees come to fruiting within two to three years. This will be helpful in converting the existing 50,000 acres under inferior seedlings into superior commercial varieties.

Standardization of rootstocks. For quick multiplication of uniform rootstocks suitability of various methods such as "stooling", "air-layering", "trench-layering" and "cuttings" was studied. The method of "stooling" was found to be superior to the other methods. Also, with a view to finding out vigorous, semi-vigorous and dwarfing rootstocks for mango, 31 types of rootstocks were classified on the basis of the growth of stem, bark percentage of roots and area of vessels in the roots. On the basis of these criteria, the varieties Chausa, Goa, Kurukkan and wild Mangifera indica were grouped as vigorous and the variety Totapari Red Small as dwarf. Further work is in progress.

Biennial bearing. The variety Neelum, which is a regular bearer, has been found to produce flowers even on the shoots emerging as late as October. This character is being transferred to other biennial commercial varieties lacking this character.

In the Dussehri variety an experiment was conducted to assess the effect of defruiting at various stages on the fruiting behaviour of those shoots in the following year. It was observed that although there was cent per cent production of shoots following defruiting at "pea" stage only 13.8 per cent of those shoots could flower. Defruiting at later stages of fruit growth did not result in flowering at all, though there was 90 per cent and 65 per cent shoot production after defruiting at marble and half-grown stages, respectively. It was concluded that some vital "substance" is depleted at a time when fruits attain "pea" size or even slightly earlier. This finding can be helpful in crop regulation through deblossoming and defruiting at early stages.

Parthenocarpy. Successful attempts have been made to induce parthenocarpy (seedlessness) in mango with the aid of kinetin, auxin and gibberallic acid sprays on unpollinated flowers. Further work is in progress.

2. Grape

Selection. With a view to selecting better varieties of grape for local conditions, 345 varieties have been introduced from different countries and also from sources within the country. On the basis of their performance the variety Pusa Seedless was selected and released. The other varieties which were found promising are Hur, Bhokri, Kandhari, Beauty Seedless and Cardinal.

Hybridization. In order to evolve early maturing and seedless varieties, hybridization work is in progress. Out of 687 hybrids raised so far, 110 have come into bearing. Selection of suitable types is in progress.

Polyploidy. The technique of inducing polyploidy in grapes has been standardized. Ninety tetraploid have been obtained from 20 varieties. In general, the tetraploid have been obtained from 20 varieties. In general, the tetraploid show earliness and increase in berry size, with fewer seeds. In one tetraploid of the variety Bharat Early, the number of berries per bunch was doubled and the seed weight was reduced to half as compared with the control. This particular tetraploid seems to be promising and further assessment is in progress.

Plant regulators. In order to increase berry size and yield in grape various plant regulators were tried. Gibberellic acid sprays (75 parts per million) showed that when the individual inflorescence were treated after 5 to 6 days of full bloom there was 75 per cent increase in yield. In another experiment it was found that two sprays of Maleic Hydrazide (500 parts per million) were effective in causing complete pollen sterility without much affecting the ovular fertility. This finding will facilitate the production of large number of hybrids.

Pruning. Investigations on training and pruning requirements of the varieties Pusa Seedless and Bhokri indicated that 4 arm "Kniffen" system was better than the 'Head' system. It has also been observed that in big plantations the pruning operation can be conveniently spread over December and January without any adverse effects. In the varieties Pusa Seedless and Bhokri pruning at 9 buds and 6 buds respectively gave higher yield.

3. Citrus

Performance. Among the sweet oranges, the varieties Pineapple, Mosambi, Jaffa and Valencia late were found to be promising under local conditions. Amonst the mandarins, Nagpuri Santara is performing better. Grape fruit varieties Marsh (seeded and seedless), Duncan, Saharanpur Special and Foster Pink were found to be good performers with fruits of good quality.

Plant regulators. Gibberellic acid sprays were found effective in increasing fruit set in grape fruit and for checking preharvest fruit drop. In sweetlime, Gibberellic acid sprays (750 and 10,000 parts per million) resulted in maximum fruit set and 2, 4, 5-T was found effective in reducing preharvest fruit drop at 7.5, 10 and 20 parts per million.

Citrus die-back. A rootstock trial with sweet oranges and mandarins has been initiated on 15 rootstocks with a view to finding out combinations resistant to virus, nematodes, and other diseases thought to be responsible for citrus die-back disease. Further assessment is in progress.

4. Papaya

Sex-determination in nursery stage: The technique of sex determinination in young seedlings was developed using colorimetric test. The sex-forecast on the basis of colour reactions was found to be correct to the extent of 67 per cent and 87 per cent in the case of male and female plants respectively. Further work is in progress to develop a cheaper and more convenient method.

Sex-expression in relation to Seasonal variations. It has been observed that with the beginning of winter the hermaphrodite plants enter an unproductive phase. The productivity of these plants was, however, restored during the summer season. This indicates that the hermaphrodite plants are unsuitable from productivity point of view in regions where distinct cool and warm weather conditions occur. This stresses the need of evolving a variety having more female flowers.

5. Guava

Hybridization. Work is in progress to evolve a high yielding, good quality and less seedy guava. Some of aneuploid types have been found to be promising.

Propagation. "Stooling" technique has been standardized in guava. By this method each plant can produce 10-15 rooted plants. An earea of 15'x15', once planted, can annually yield about 300 uniform rooted plants for several years. This method is cheaper and more convenient for multiplication of nursery plants than the usual methods so far followed by the nurserymen. Technique of veneer grafting has also been standardized and maximum success can be obtained from July operationing. It has also been possible to multiply guava plants by 'cuttings' with the aid of growth regulators (indolebulyric acid, 5000 parts per million). The success was 75 per cent.

Effective rootzone. The rootactivity distribution pattern of 12 years old guava seedlings was determined under field conditions by radio-tracer technique. Absorption capacity of roots was greater near the tree trunk than at the drip line of the tree. These findings suggest that the fertilizer applications should be made near the trunk at a depth of 30 cm.

6. Strawberry

Selection. In strawberry, the variety Pusa Early Dwarf, evolved as a selection made from the local material was found to grow well under Delhi conditions. Other varieties, which have been found promising under local conditions are Katrain sweet, Tioga, Solana and Torrey.

Plant regulators. Application of Gibberellic acid (75 parts per million) and Urea (1 per cent) to the variety Pusa Early Dwarf gave tremendous response. November applications gave highest yield per plant, better berry size and early and uniform ripening.

7. Phalsa

Plant regulators. An experiment was conducted to find out the effect of various concentrations of growth regulator on yield. An increase in yield of 105 per cent was obtained over control with a single spray of Gibberellic acid (60 parts per million) + urea (1 per cent).

8. Pome and Stone Fruits

Collection of different wild species of pome and stone fruits (apple, pear, peach and plum) is in progress. Some valuable wild species have already been collected for assessment.

II VEGETABLES

The research work on vegetable crops is being carried out at Delhi and at the Sub-station of the Division located at Katrain in Kulu Valley (Himachal Pradesh). Following the initial progress made by the Division of Botany in releasing different varieties of vegetables, either as direct introductions, or bred ones, emphasis has been laid on the improvement by breeding to tackle different problems of vegetable cultivation.

At Delhi, a root knot nematode resistant variety in tomato Sl. 120, has been evolved from a breeding stock obtained from Hawaii. This variety is suitable both for spring-summer and autumn seasons of North India and is good yielding with attractive medium to large sized fruits which are less seedy. An Asiatic pungent variety of radish, Pusa Deshi has been evolved for early sowing in August and September to replace the existing heterogenous Desi variety cultivated by the farmers. In watermelon, an exotic introduction from USA, called Sugar baby has been tested and released to the farmers and the fruit of this variety are medium sized, deep pink and sweet flesh with small seeds.

In brinjal, a derivative of the cross between Pusa Purple Long and Hyderpore, has proved promising in yield and quality of fruits. The fruits are oblong, dark purple in colour, attractive and the high yielding character of the first parent has been retained. In Palak (beet leaf Betavulgaius) a giant selection hasbeen made, with big leaves, soft leathery texture and with good yield and regeneration capacity. It is under large scale test before release. In garden pea, an exotic introduction from USA Little Marvel and a French introduction Arkel have been found to perform well as early varieties. The pods are well filled, sweet, andyield well compared to the the present early varieties under cultivation. In muskmelon, purification and selection of indigenous types have been in progress and sweet high yielding types have been selected in two Rajasthan collections, one of Punjab and another of Uttar Pradesh. Besides, derivatives of the cross between a Punjab selection and exotic cantalloupe, have been found promising in having thick attractive orange, sweet and melting flesh, small seed cavity and good transportable quality. Progress has been made in producing triploid seedless watermelon and the combination found to be promising was Tetna-2^x, Red Fleshed Jaipur.

Heterotic breeding for increased yields has been taken up in brinjal, tomato and bottlegourd. In brinjal 97 per cent.increased yield in Flover the better parent has been obtained by the combination Pusa Purple Long X Hyderpore. In tomato F_1 gave 50 per cent higher yield in the combination Pusa Ruby X Best of All. Recently, the root knot nematode variety Sl.120, has been found to be a good combiner which confers additional advantage in F_1 viz. the resistance combined with high yields. In bottlegourd both in round and long varieties, two promising combinations have been selected.

Breeding for disease resistance, especially of virus disease has been initiated in tomato (TMV and leaf curl) and brinjal (little leaf). Some progress has been achieved in selecting resistant lines and further breeding work is in progress, to evolve resistant and also high yielding varieties. A PL-480 scheme has been in operation touching some of these problems. Recently breeding for resistance to nematode in brinjal and tomato and bacterial black rot in cauliflower has been initiated.

Another aspect of work in progress is the use of plant regulators in increasing crop production. In cucurbits significant progress has been achieved in modifying the sex ratio, towards production of greater number of female flowers. In cucimber, conclusive results have been detained at Delhi, Katrain, Jamna River bed that MH 50 to 100 ppm and GA, at 10 ppm applied as aqueous sprays at 2.4 true leaf stage induces higher number of female flowers and increased yield of the order of 29 to 56 per cent. Similarly in watermelon TIBA 25 ppm and Boron 3 ppm have been found to be efficacious in increasing the female flower production and thereby the yield. In bottlegourd also Boron 3 ppm has been found to be promising. Seed treatment with plant regulators before sowing has been found useful in increasing the yield of tomato and brinjal. The checmical is most effective at 2.5 ppm.

At Katrain Substation of the Horticultural Division, greater importance has been bestowed on the improvement of temperate vegetables. At this station, significant progress has been made in selecting a Snowball strain suitable for cultivation in North Indian plains during winter. The strain EC 12013 has been found to produce good quality seeds at Katrain conditions and its performance in the plains is comparable to any seed imported usually. In cabbage, a variety resistant to Black leg (Phoma Lingam) under field conditions has been evolved, and is released as Pusa Drumhead. In Frenchbean, an exotic introduction from USA, called Contender has been found to be a good yielder both for pods and seeds.

Hybridisation between Black and Japanese white, in radish has yielded a new variety suitable for spring sowing in hills. Similarly by hybridisation and breeding in turnip two new varieties called Early Snowball and Early Golden ball, have been evolved for earlier maturity than the respective parents.

Heterotic breeding in cabbae, has brought out the detection of marker genepigmentation in the petiole in the nursery stage useful for commercial production of hybrid seeds. In tomato, functional male sterile character-closed-another has been transferred to cultivated varieties in an effort to reduce the cost of hybrid seed production. In cucumber, a high degree of hybrid vigour has been observed in a promising combinatio involving a gynoecious line.

Another important activity is the production of nucleus seed of important recommended varieties of vegetables at Delhi and Katrain, which are distributed to National Seeds Corporation for multiplication as foundation seed. Besides, small quantities of commercial seeds are sold to Delhi Administration and public. Annually nearly 4,000 kg. of vegetable seeds are produced and sold from the Horticultural Division.

Fruit and Vegetable Preservation. Considerable amount of research work has been done to standardise varieties of fruits and vegetable suitable for processing.

For purposes of canning, peas with an alcohol insoluble solids content between 15 to 16.5 per cent were found to be better. These were found to sink in

5% salt solution and float in 12% salt solution. Bonneville, NP.29, Yates Early crop, Early Giant, Lincoln, Duke of Albany, Marrowfat, American Wonded, Telephone, Selection No. 2, Delvitch Commando and Early perfection varieties were found to be promising for canning in brine containing 2% salt and 2% sugar. For dehydration, Bonneville, Lincoln, NP29, Little Marvel, Duke of Albany, Arkel and Selection No. 2 have proved satisfactory for dehydration. The drying properties and colour retention of peas were improved by blanching in 5 to 6% salt solution containing 0.1 to 0.15% sodium bicarbonate and 0.1% magnesium oxide, for 5 to 6 minutes followed by sulphitation in 0.5% KMS solution for 30 minutes.

King Humber, Italian Red Pear, Local Chhohara, Japanese, Local Chhohra sada, San Margano, Chesapeake and Best of All varieties of tomato were found to be suitable for preparation of puree and paste. Pusa Ruby as well as the varieties listed above were also found to be suitable for preparation of Ketchup. For purposes of canning the whole peeled tomatoes in their own juice, the variety Italian Red Pear was found to be the best. Calcium firming by soaking the peeled fruits in 2 per cent CaC 12 solution for 20 minutes prior to canning or addition of CaC 12 @ 0.1 per cent of can content was found to be necessary for retention of good texture.

Canning of carrot shreds in a heavy syrup of 60° brix was found to be better than canning in brine in respect of quality retention during storage at room temperature, particularly with reference to B Carotene.

Addition of ascorbic acid @ 200 mg/100 gm. can content before processing further improved the quality. A dried product from carrot shreds, which reconstitutes quickly in milk or water, has been prepared from blanched carrot shreds which could be used successfully as a breakfast food. A process for the preparation of a baby food based on carrot has been standardised and patented.

For squash making, Eureka Lemon was found to be superior followed by Nepali Oblong and Italian. In case of mango Langra was found to be superior followed by Dussehri and Chousa. Natural flavour was best retained when preserved as juice/pulp rather than in the form of squash. Kaula variety of mandarin, Mosambi variety of sweet orange and Sampson Langelo were also found to be suitable for squash making. Foster Pink and Marsh varieties of grapefruit were also found to be promising for squash making. Studies were made on the standardisation of method of preparation of unfermented sweetened beverages from Guava. A squash of 50° brix, 1.0% acidity, 350 ppm SO2 had had good retention of vitamin C and flavour. Cloud stablization could be improved upon by addition of gum tragacanth or pectin. Preliminary studies were also undertaken to study the dehydration of guava fruit as halves and as pulp powder and leather. Studies were also undertaken on microbiological composition of apple preserve. Irradiation of apple preserve, in general, showed an increase in browning, and loss of ascorbic acid and flavour.

Pusa seedless variety of grape showed promise for preparation of raisins and unfermented juice. The raisins, how ever, were found to darken rapidly and were less sweeter than the raisins prepared from imported seedless grapes. Further studies on this aspect are in progress.

Current and Future lines of work. Work on varietal screening studies and processing technologies with respect to grape, guava, mango, pear, and tomato are in progress. Varietal response of different fruits and vegetables to different storage treatments is also being studied.

SALIENT FEATURES OF THE WORK DONE BY CENTRAL FOOD TECHNOLOGICAL RESEARCH INSTITUTE, MYSORE

The Central Food Technological Research Institute (CFTRI), one of the National Laboratories of the country under the Council of Scientific and Industrial Research, was established in October 1950. The main objective of the Institute is to carry out research and development work in the field of food science and technology to augment the food supplies and improve the nutritional standards through the utilization of the available scientific knowledge as well as the development of new knowledge in the field of its activities. The research programme is undertaken on well identified problems with clear objectives and definite time targets.

The work of CFTRI is at present divided into twelve broad fields of activities. The research projects are both disciplinary and inter-disciplinery in nature, depending upon the programme of work in each project. The twelve Disciplines of the Institute work on the following major areas:

1. Applied Nutrition and Dietetics
2. Biochemistry
3. Cereal & Confectionery Technology
4. Food Engineering
5. Fruit & Vegetable Technology

6. Infestation Control & Pesticides
7. Meat, Fish & Poultry Technology
8. Microbiology
9. Protein Technology
10. Spices and Flavour Technology
11. Industrial Research, Consultancy & Extension
12. Training Programme

Specialised facilities have been created to assist the industry in solving their problems and utilise new know-how, techniques, processes and products through the technical consultancy and advisory work. Also process development engineering and training facilities have been built up to scale up the results of research for commercial utilisation and train the required personnel.

Experiment Stations in different parts of the country have also been located to disseminate scientific information and also to understand and identify regional problems so that more realistic research programmes could be formulated so as to serve the best interests of the growers, processors and the consumers. These Stations, at present, are located at Trichur, Mangalore, Bombay, Hyderabad, Nagpur, Lucknow and Ludhiana. They also provide on the spot advice to the industry.

A special laboratory is in existence to analyse and examine several thousand samples of fruit and vegetable products over the year so as to help the enforcing and regulatory authorities of the Government to ensure the good quality of processed products to the consumer.

A two-year Post-Graduate Course in the field of food science and technology to train personnel for the food industry has been in existence. Since 1965 this training facility has been expanded to accommodate students from South-East Asian Region under the agreement between F.A.O. and Government of India. This Post-Graduate Course is recognised by the Mysore University for Master's Degree. Short Courses in specialised areas are also conducted from time to time.

Fruits & Vegetables

Fruits and vegetables produced in the country undergo heavy losses due to lack of proper facilities during storage, handling and transportation. Considering the inadequate refrigeration facilities in the country, an emulsion formulation has been developed to preserve these perishable commodities at ordinary temperature. The emulsion is wax-based and can be applied on fruits both on small as well as large scale, immediately after harvest. Work on the use of growth regulators as pre and post-harvest sprays along with fungicides has given encouraging response in extending the post-harvest storage life as well as improving the quality of some commercially important fruits.

The optimum post-harvest cold storage conditions have been worked for many commercially important fruits and vegetables and the results are being utilised by the industry.

Banana is one of the very important commercial fruits in the country. A great deal of interest has been shown by several countries for import of Indian bananas. Conditions have been standardised for harvesting, handling, transportation, storage and packaging of these bananas for export purposes. Trial shipments made in 1965-66 and 1967-68, have amply established the possibility of successfully exporting Indian bananas to Europe, U.S.S.R., and Japan.

Processing techniques have also been developed to manufacture products like fruit juice powder, fruited cereal flakes and strained baby foods for indigenous as well as export purposes. Several countries have shown interest to import fruited cereal flakes, especially that with mango fruit, from India.

The process developed and standardised for the manufacture of papain and pectin from raw, mature papaya fruit has helped in the establishment of an industry in the country to curtail the import of these two products which are very vital to the food industry. Techniques have also been standardised for the preparation of canned products such as juices, squashes, preserves, syrups and canned fruits and vegetables. Speciality products like fruit bars and toffees have also been developed which are finding very good consumer preference on a commercial scale.

A process for the manufacture of commercial pectolytic enzyme has been standardised to be used in the preparation of juices of acceptable quality such as banana, guava etc. Similarly the information on the production of wine from Indian grapes and fromcashew apple have been very much appreciated by the industry.

Products developed and standardised in the Institute such as tonic and medicated wines containing fruits and herbs are refreshing and non-alcoholic beverages containing ginger extracts and fruit juices have been a commercial success.

Hot water treatment has been successfully tried out for uniform ripening of mangoes and reduction of spoilage during the process of ripening.

A special equipment has been designed for the manufacture of hot preserves. The work on pineapple processing has led to the doubling of the processed fruit out-turn per acre which has benefitted the industry tremendously.

Spices, Coffee & Tea

These raw materials play a very dominent role in the country's economy. These products are the largest foreign exchange earners. A process has been developed for the manufacture of white pepper from green or black pepper, a product which is in great demand in foreign countries; the pepper husk which is a by-product during the manufacture of white pepper can be used for the extraction of pepper oil. A method for the preservation of green colour in cardamon has benefitted the cardamom export to Middle-Eastern countries. Similarly, work on the manufacture of cardamom oil has shown bright prospects for export. The unique feature of the know-how for cardamom oil is in its simple and economical distillation procedure and utilization of inferior grade cardamom.

Storage of coffee in the moist coastal areas has been a problem. It has been shown that by adopting the ballooning and fumigation techniques standardised and developed at the Institute, this can be overcome. Production of a special type of coffee (monsoon coffee) preferred in some European countries, is a time consuming process, having all the disadvantages of insect and fungal infestation. A convenient and accelerated process of monsooning coffee is developed which is an improvement over the traditional method.

Work on Instant Tea from green tea leaves has reached an advanced stage of development, and the economics of the process are being studied.

An improved process has been developed for the preparation of deep fat fried salted cashew kernels. The concentrate of tamarind extract has found good acceptability both by the Indian consumer as well as tamarind importers from several countries. This has brightened the export of concentrate instead of tamarind or tamarind pulp.

Protein Foods

The buffalo milk, hitherto, was not considered fit for making baby food. The process know-how provided by the Institute made it possible to manufacture a nutritious baby food from buffalo milk. The entire quantity of baby food manufactured in the country is made from this milk.

Since the availability of milk in the country is not keeping pace with the need, it has long been felt to find out an alternative source of feeding the infants and children with equally nutritious products. Efforts are under way to develop baby food based on plant protein material and weaning food based on cereals, pulses etc. to meet the growing demand of the young children in the country. The products so far developed in this direction have shown very good promise.

Oilseeds and legumes which are rich sources of protein have been successfully used in developing several products having supplementary food values and which can be used to combat protein mal nutrition in the country. Defatted peanut meal and Bengal gram in a blend fortified with amins and minerals gives an economical and nutritious product to supplement the nutritionally poor diet of the mass. The product is being made commercially in different parts of the country.

The process for the production of groundnut protein (purity - 90% and above) has been given to a private party which is manufacturing this product at the rate of 2 tons per day. The protein isolate forms the basis for protein rich products such as infant foods, beverages, icecream mix, liquid milk-like product and high protein toffees etc.

The work on aflatoxin developed on groundnuts due to growth of *Aspergillus flavus* has led to the development of a technique to destroy the toxin in the groundnut meal as well as check the development of this mould soon after harvesting of the nuts. This development has made it possible to use the commercial meal for human consumption.

Infestation Control & Pesticides

Effective and economical methods have been developed for control of insect pests which cause heavy damage to food grains during handling of storage. Durofume process for fumigation in bulk storages has become very popular. Similarly, fumigant tablets for small scale and household grain storage are showing promise. Insecticidal formulations for treating the gunny bags to prevent cross infestation are playing an important role in storage of food grains.

Non-toxic insecticides have been developed from inorganic salts and activated clay for safe use in rural areas.

Work on rodent control has widely been appreciated.

Grain Processing

The improved method of parboiling of paddy has helped the rice millers in producing a product free of fermented odour. Techniques have also been worked out to stabilise the ice bran and preserve the quality of the material for solvent extraction. The desigh improvements are being made for various unit operations in rice milling.

The ready mixes developed as a convenient food are the fast moving products on the market. These products have also shown export potentials.

Meat, Fish and Poultry

The sardine fish which perhaps the largest catch on our Western Coast has proved to be a good raw material for the extraction of good quality oil and meal. This provides an economical method of using the bumper fish catch.

An emulsion from petroleum fractions has been developed for coating eggs to extend the storage life, both at room and refrigerated temperatures. This operation preserves the quality of the eggs and is also very economical.

Conditions have also been standardised to commercially manufacture egg powder which may help the poultry farmers to channel their surplus eggs.

Know-how for the production of albumen flakes required by the printing industry has also been standardised. Work on the development and standardisation of products like ham, sausage, dressed chicken etc., is giving promising results.

Dehydration

Studies have been carried out for the preparation of dehydrated products from fruits, vegetables, meat and poultry, Development of pre-cooked dehydrated rice and dhal has been standardised for defence forces.

An improved design for accelerated freeze drying has been worked out.

Packaging

The packaging section helps in designing and developing packages for all the food products developed in various disciplines of the Institute. On request from industry, studies are undertaken on designing and testing of packages and expert advice given to the industry.

Annexure M

ROLE OF STC IN EXPORT OF HORTICULTURAL PRODUCTS

The State Trading Corporation of India (STC) has been promoting exports of fruits, fresh and processed, from India during the past few years, a short resume of the efforts so far made by STC in this direction is given below.

Export of Bananas

The Maharashtra and Gujarat Co-operative Societies made trial shipments of bananas to USSR and Italy in 1963 but the bananas ripened during the sea voyage and hence the Societies had to suffer heavy losses. The Societies were shy of exporting any more for fear of losses due to damages in transit. At this stage, STC stepped in and took up export of bananas.

The banana plantations in India consist of one or two hectares of land and are spread over vast areas unconnected by road or rail. Even in Maharashtra and Gujarat where there are large continuous plantations of bananas, they are spread over 100 square miles belt from Kajgaon to Raver on the Central Railway and about 80 square miles around Surat on the Western Railway. Banana gardens are generally unconnected by road.

According to the exports, for a consignment of 1,000/1,200 tonnes of bananas 1½ to 2 lakh bunches were required all of which should be of 75% maturity at a point of time, selected out of practically a million bunches, which had to be cut, packed and loaded into the ship within 36 hours of their cutting from plants. The banana gardens for such supplies had to be 400 to 500 in number in Jalgaon and 300 to 400 in Bardoli. The task seemed to be difficult in the context of wide area over which the banana plantations are spread, the rough terrain over which the fruit has to be moved in trucks and even in bullock carts and brought to packing centres, then loaded into railway wagons and finally loaded into the ship within a period of 36 hours. STC, therefore, sought technical guidance from the Central Food Technological Research Institute, Mysore, Technical Adviser (Food), Ministry of Food and Agriculture and the Horticulture Departments of the States of Maharashtra and Gujarat. Techniques of banana exports were developed by experimentation by the scientists of CFTRI in the laboratory as well as in the field and arrangements were made for speedy movement of bananas from plantations to the port of shipment and a brochure on methods of selection of bananas of 75% maturity, their cutting, packing and transportation was prepared. The brouchure was translated into Gujarati and Marathi and printed copies distributed to over 2,000 growers in Jalgaon and Bardoli areas. A foreign Technical Expert was invited and a training programme was organised with the assistance of the scientists of CFTRI under his supervision, when various methods to be followed were explained to the growers followed by demonstrations in the field.

Experiments were undertaken to guage the efficiency of these methods by preparing a small consignment of three tonnes of bananas in gardens and keeping it an controlled temperature in cold storage in Bombay for a period of 3 weeks. A further experiment was performed to check upon the effficiency of the arrangements and of the antifungal treatment applied to cut ends of banana stems during the sea voyage. 5,000 crates containing about 11 kg of bananas, each packed in hands, were sent to Kuwait in the hold of a Refrigerated Banana Carrier m.s. 'Frigora' which had been chartered by the Cooperative societies for their Persian Gulf trade. The m.s. 'Frigora' returned to Bombay after 18 days of voyage and on opening the crates it was found that rotting of stem had been negligible. It was felt that procedures laid down for preparation of the consignment of bananas were satisfactory.

The foreign buyers were, however, still hesitant in purchasing bananas from India after failure of the consignments sent by the Cooperative Societies in 1963. However, a Delegation from USSR visited India in August, 1965, and was taken round the plantations and explained the various procedures which were to be followed in the preparation of the banana consignment for export.

A contract was thereupon signed for trial shipment of 1,000/1,200 tonnes of bananas to USSR in September-December 1965.

Elaborate arrangements for c-ordinating cutting, packing, transportation and loading of the ship were made with the help of the Jalgaon District Fruit Sale Societies Cooperative Federation and Gujarat State Co-operative Fruit and Vegetable Marketing Federation, the Railway Board, the Central and Western Railways, Bombay Port Trust and Plant Protection and Quarantine Department, etc. Nail free wire bound crates were distributed to growers in the gardens. Inspectorate and field staff was posted in various packing centres to supervise the operation and to ensure that bananas conforming to the specifications laid down in the contract with the Russian buyers only were packed for export and timeschedules were strictly adhered to. Due to co-operation of the Railway, Port Trust and State Departments of Horticulture, the arrangements worked well. Three experimental shipments totalling 1,046 tonnes of bananas valued at Rs 0.78 million were were exported to the USSR in 1965. Bananas reached the estination in green condition. The qualitative acceptance of bananas of the first shipment was 85.6%; of the second 88%; and of the third shipment 92%. The progressive increase in qualitative acceptance was heartening and it was possible to establish for the first time the technical feasibility of exporting bananas to distant destinations beyond Suez Canal.

The consignments had, however, involved considerable amount of developmental expenditure on account of high cost of ocean freight and expenses on packaging. Efforts were, therefore, concentrated on effecting economies in expenditure by using cheaper packing material and reducing the incidence of ocean freight by increasing the size of a single consignment, with a view to establishing commercial feasibility of banana exports. However, in the meantime, the banana exporting countries in Central and Latin America had switched on to sophisticated cardboard packing. Polyethelene tubes, which had been used by various exporting countries in the past, were completely discarded. While it was decided to experiment on the use of polythene tubing for export of bananas to the USSR in 1966, the guidance of CFTRI was sought for developing a cardboard cardboard carton of the design used by other exporting countries in the world. CFTRI was also requested to develop an indigenous antifungal chemical to replace American vancide peps to save expenditure in foreign exchange. Experiments on efficacy of the antifungal chemical and suitability or otherwise of different types of packing material were continuously made by CFTRI. A further contract for export of 5,000 tonnes of bananas to USSR was signed by STC with Messrs Sojuzplodoimport in 1966. 5,366 tonnes of bananas valued at Rs 5.76 million c.i.f. were exported to USSR and qualitative acceptance improved to 96%. Polytheylene tubing was used in the first shipment with tremendous success but the packing had to be gradually changed to cardboard cartons. The developmental expenditure was also progressively decreased shipment by shipment and ground prepared for launching of exports on commercial lines.

The efforts of STC to develop export of bananas to USSR, however, received a set-back due to the closure of the Suez Canal as bananas could not stand the long sea voyage via Cape. However, Japan showed a silver lining, though 5,500 miles from Bombay port. Japan had been buying bananas from Taiwan, Ecuador, Panama etc. who were in the trade for over a century. However, a breakthrough was made to develop an additional market to maximise foreign exchange realisations by introducing competitive foreign buyers in the trade.

Negotiations for export of bananas to Japan had been going on for sometime past through the Indian Embassy in Tokyo. The sale of 4,000/5,000 tonnes of bananas was negotiated by STC with the buyers in Japan early August, 1967. Accordingly, a Japanese team of buyers visited the country to see the conditions of production, packaging and transport for themselves and after discussions with several interests concerned agreed to conclude a contract with STC for the import of 5,000 tonnes and more of bananas depending upon the success of a trial shipment. The first ever experimental shipment of 1,065 tonnes of bananas valued at Rs 1.04 million was accordingly made to Japan on November 27, 1967. There was however considerable hesitancy in shipping bananas to a more distant destination, as apart from the technical and hygenic regulations of a more sophisticated and quality conscious buyer like Japan, there were grave risks of delays in transit and consequent possibility of over-ripening of bananas in transit. The quality specifications of Japanese buyers (who are accustomed to hardier varieties, namely, Giant Cavendish and Gros Michel which conform to the specifications that the net weight of each hand of bananas shall not be less than 1.5 kg), proved to be extremely rigorous. Bananas reached the Japanese port in green condition but qualitative acceptance was up to 60% only. It has, however, established the possibility of opening a new market which could take substantial quantities of bananas. In consonance with this step it has been projected that by the end of 1971, India should be able to ship a minimum quantity of 50,000 tonnes of bananas of the CIF value of Rs 50 to Rs 60 million to the world markets.

Export of Mangoes

Mango is another fruit where commercial research with a view to proving technical and economic feasibility of export to distant destinations in Europe and developing new markets has been undertaken by STC. STC took up export of mangoes on commercial scale in 1967. Two brochures highlighting selling points for consumers and departmental stores were printed for distribution at fruit stalls in Europe and UK.

Arrangements were made for experimental shipments of mangoes to Europe and UK on scientific lines. They included securing of refrigerated shipping space where controlled temperature and humidity could be maintained, devising suitable packing material and means of its fumigation, procurement of mangoes from gardens, determination of maturity at which mangoes should be picked, packaging, transport to Railway siding, provision of rail wagons and their speedy movement to the port of shipment and loading on the ship. Technical guidance was obtained from CFTRI and Technical Adviser (Food), Ministry of Food & Agriculture. A brochure entitled 'Techniques of Mango Export' was prepared and distributed over 200 growers in Bulsar area for their guidance with regard to the various procedures to be followed for preparation of export consignments.

The Shipping Corporation of India were requested to arrangefor refrigerated shipping space where controlled temperature could be maintained. They were able to secure refrigerated shipping space for only 8 tonnes of mangoes on a passenger-cum-cargo ship named M.V. 'President Jackson' scheduled to leave Bombay on May 7, 1967.

The M.V. President Jackson which sailed from Bombay on May 7, 1967 was due to reach Marseilles on May 20, 1967. However the vessel was delayed owing to unforeseen reasons and reached Marseilles on June 1, 1967 i.e. after 24 days. Only 6% of the mangoes deteriorated in transit. Arrival of 94% mangoes in good condition during the first experimental consignment by sea was thus heartening and showed promise of successful commercial export of substantial quantities of mangoes by sea to European destinations in course of time.

Mangoes were sent on consignment basis and were sold by STC's Rotterdam Office to the buyers in Zurich, Rotterdam, Geneva, Marseilles and London in the range of 4 sh. to 6 sh. a kg.

Having been thus encouraged a second trial shipment was despatched to London. This shipment was made per M.S. President Coolidge on May 27, 1967. Due to closure of the Suez, this shipment had to be diverted via the Cape and reached Marseilles after 42 days. At the time of unloading, 80% mangoes were found to be in good condition and, therefore, they were transported by road to London for delivery to the London buyer. However, mangoes deteriorated rapidly after being taken out of refrigeration, possibly because they had already outlived their storage life, and became over-ripe before they could be delivered to the buyers in London.

These two trial shipments of mangoes which were made for first time in the commercial history of mango exports have, however, proved the technical feasibility of exporting mangoes to distant destinations like France, West Germany, Switzerland and Netherlands and U.K. by sea. These shipments have already generated demand for mangoes in substantial quantities in Europe and UK which could not be met due to closure of the Suez Canal. It is hoped that by sustained efforts, it would be possible to develop markets for Indian mangoes in Europe and UK and to earn substantial amount of foreign exchange from their export.

Commercial research on similar lines is being carried out on other fresh fruit like Sapota (Chickoo and Mandarin Oranges. Their technical and commercial feasibility is being examined and experimental shipments of these fruit will be organised as soon as possible.

Export of Fruit Products

STC in its efforts for exploring new markets for fruit products began by displaying Indian fruit juices and canned fruit at International Fairs and Exhibitions and serving them at international gatherings. These efforts succeeded in the form of a bulk order for about 300 tonnes of mango nectar, pineapple juice, and mango slices valued at about Rs 0.5 million for the first time. STC has since been organising supplies of fruit juices to USSR. The quantity and value of fruit juices exported by STC to USSR in the last few years are as follows:

	Quantity (Tonnes)	Value (Million Rupees)
1963-64	290	0.47
1964-65	943	1.39
1965-66	1308	1.79
1967-68	750	1.33
1968-69(Est.)	1000	1.84

Considerable quantities of fruit juices also being exported by the manufacturers themselves to the USSR. STC also has succeeded in concluding a contract for export of mango slices and mango pulp to West Germany.

EXPORT OF BANANAS TO USSR AND JAPAN DURING 1965 TO 1967

ORGANISATIONAL CHART

Year	Total No. of Shipments	Name of the Country	Quantity supplied (in tonnes)			No. of Primary societies which participated in the shipment	No.of Growers	No.of Gardens	No.of packing sheds	No.of wagons/Trucks
			Jalgaon* +	Bardoli+	Total					
1965	3	USSR	606	596	1202	17	241	241	119	91 wagons
1966	5	USSR	4054	1923	5977	17	462	462	256	560 wagons 59 trucks
1967	1	Japan	725	388	1113	20	430	430	189	125 wagons

* The Jalgaon District Fruit Sale Societies' Co-operative Federation, Jalgaon.

+ The Gujarat State Co-operative Fruit & Vegetable Marketing Federation, Bardoli.

SPECIFICATIONS FOR FEASIBILITY STUDIES

The important factors in considering the selection of a plant site, establishing a factory and/or packing house for processing fruits and vegetables should include the following specifications.

Agriculture

A thorough agricultural survey must be made from a phenological point of view to be sure that the most favourable conditions prevail for the crop or mix of crops to be processed. This survey should include:

Climate

Climatic conditions, especially temperature and rainfall, which are natural phenomana that can not be changed, must be carefully studied to be sure that optimal response from the plants and/or trees, to these factors will be obtained, expressed in high yield rates, and good quality of produce.

Soils

A. The topgraphy and physical characteristics of the soils must be favourable for the culture and optimal growth for the crops selected.

B. There must be adequate area of these good soils available, within reasonable proximity of the plant to supply entire raw produce that will be required within the foreseeable future.

C. Detailed soil analysis must be made from samples taken from the entire area to determine:

i) soil composition and charactristics

ii) quantities of usable minerals and plant nutrients available to assist in establishing fertilizer programes and costs and,

iii) Drainage and water for irrigation availability, so that a comprehensive water management programe can be established and costed.

Diseases

Presence of and/or likelihood of encountering problems with disease, pests and nematodes must be established for maintaining control programes that will be required.

Variety Selection

Variety selection studies, coupled with field trials should be made to be sure that proper varieties are used to obtain optimal field yields and quality, at satisfactory costs.

Social and Economic Phases

Social, and economic phases of the agriculture of the area must be studied to make certain a satisfactory agricultural extension programe can be established and maintained to ensure higher yields and better workable relationship with the growers.

Transportation

Transportation for raw produce to the plant must be at optimal costs and minimum damage to the produce. Studies must be made to determine how this can be accomplished in the area under consideration and what the costs would be.

Processing

Factory site should have good and efficient access from transportation point of view -- both from the point of view of availability of raw produce and packing supplies to the factory and also in despatching the finished product. These features must be studied with a view to enabling establishment of such facilities at optimal costs.

Plant layout must be carefully and efficiently done to provide the following:-

A. Adequate protection in housing for machinery, equipment, supplies and finished product and facilities for the personnel.

B. It should be of such construction as to be adequate and easily maintained, but not more costly than to provide functional facilities needed.

C. Both plant sits and buildings should provide adequate space and facilities for all future expansion that may be required, without disrupting existing construction.

D. Ample space to install additional equipment and machinery as may be needed within the reasonable future.

E. Installation of machinery and equipment should be on a straight flow from raw produce to finished product storage basis -- still providing ample working space around the equipment.

F. Ample water for processing and potable water for use in finsished product must be available.

G. Sewage disposal facilities must be adequate for expanded production and compatible with health and government regulations of the area.

All these features must be carefully investigated to avoid problems and excessive costs in establishing processing facilities.

Machinery and equipment line-ups and lay-outs must be thoroughly planned and enginnered. Sources and costs equipment and machinery - delivered and installed with guaranteed satisfactory operation must be carefully planned and budgeted.

Social and political aspects must be investigated to insure a favourable and cooperative climate for the new industry -- and that laws, regulations, codes, etc. are favourable or made so by local authorities, for entering the locality and carrying out construction plans.

Local standards, regulations, controls etc. affecting the operation should be objectively and ethically administered. It should be ascertained that this will be done.

Studies of labour quality, availability and costs must be made to determine costs that must be optimal -- and also stable and reliable from a long range point of view.

Housing, social, educational and recreation facilities must be available and adequate for management, technical and supervisory personnel - and if not, they must be provided to maintain satisfactory long range operations. These features must be studied, costed and budgeted.

Financing

Adequate financing must be available or arranged. This must be thoroughly studied for both the agricultural and processing phases of the operation. Usually it should fall into the following general programe.

Building, machinery and equipment and fixed investments in general should be covered with some form of share capital and/or long term loans, with ten to twenty years repayment facilities with low rates of interest.

Long term development farms for crops of long term nature such as fruit orchards, asparagus fields, etc. should also be financed on a basis similar to fixed plant facilities.

Expansion programmes must also be provided for in-financing plans.

Short term financing - 6 months to 5 to 7 years should be made. This should be adequately available for the following:

A. Grower assistance loans

B. Rolling stock and "semi-fixed" (Machinery and equipment)

C. Working capital

While the foregoing is intended to cover the establishment of new units, most of the factors outlined apply to or must be taken inconsideration when expanding existing units operation.

Experience has shown, that using teams of specialists, for making such feasibility studies, is a sound manner for achieving success. Depending on the size and complexity of the project, the following discipling should be included in each team, the number of men depending also on the complexity and depths of problems expected to be encountered.

Agriculture

Soils speciality, Psysiology, Entomology, Pathology, Water Management and Economics.

Processing

Food Plant Engineering, Food Technology - Production Management. General Management to cover marketing requirements, financing, personnel and social features and to coordinate all other activities of the team.

ANNEXURE O

EXPORTS OF FRESH FRUITS AND VEGETABLES

A. FRESH FRUITS

Quantity: Tonne
Value: Rs '000

Product Group	1965-66(Act.)		1966-67(Act.)		1967-68(Prov.)		1970-71(Est.)		1975-76(Est.)	
	Qty	Value	Qty	Value	Qty	Value	Qty	Value	Qty	Value
Bananas	8,391	3,768	8,062	3,721	2,813	1,928	10,000	6,000	100,000	60,000
Mangoes	636	853	810	1,126	1,072	1,818	3,000	3,900	10,000	13,000
Citrus	138	157	205	318	240	416	700	700	15,200	19,000
a) Oranges	91	90	180	275	169	298	500	500	10,000	12,500
b) Limes & Lemons	46	64	22	40	64	110	200	200	5,000	6,250
c) Grapefruits	Neg	Neg	3	3	3	3	-	-	200	250
d) Others	1	3	-	-	4	5	-	-	-	-
Lychees	-	-	-	-	-	-	500	1,800	2,000	7,200
Grapes	48	115	2	5	3	8	50	100	1,500	3,000
Strawberries	37	20	40	22	12	7	50	100	500	2,000
Melons	-	-	-	-	-	-	10	20	2,000	4,000
Sapota (Chickoo)	5	5	4	4	9	18	50	100	500	1,000
Pineapples	16	22	1	2	5	7	50	50	200	200
Apples	7	29	3	10	2	7	10	30	100	300
Peaches	5	7	-	-	-	-	-	-	100	150
Apricots	52	77	8	16	3	10	50	150	100	300
Pears - Quinces	8	3	-	-	Neg	Neg	-	-	100	50
Papaya	-	-	-	-	-	-	10	20	100	200
	10,176	5,513	9,234	5,425	4,367	4,809	15,000	16,400	133,000	118,000

B. FRESH VEGETABLES

Quantity: Tonnes
Value : Thousand Rupees

Product Group	1965-66(Act.)		1966-67(Act.)		1967-68(Prov.)		1970-71(Est.)		1975-76(Est.)	
	Qty	Val	Qty	Val	Qty	Val	Qty	Val	Qty	Val
Onions	98,830	25,226	91,919	44,357	103,362	41,831	125,000	51,000	150,000	61,000
Potatoes	2,173	1,065	977	588	547	465	2,000	1,700	10,000	8,500
Seed Potatoes	Neg	Neg	11	20	-	-	100	200	500	1,000
Cabbages	Neg	Neg	1	1	2	2	40	30	200	150
Carrots, Turnips, Raddish, Knolkhol	Neg.	Neg	Neg	Neg	2	1	20	10	100	50
Cauliflowers	3	4	1	1	1	2	40	60	200	300
Other Fresh Vegetables (Tomatoes, French beans, Aubergines, Capsicums, Okra, Tinda, Parwal, Karela, Salad Type Vegetables etc.)	721	582	751	605	1,651	1,640	2,800	3,000	16,000	16,000
Total	101,727	26,877	93,660	45,572	105,565	43,941	130,000	56,000	177,000	87,000
Grand Total	111,904	32,390	102,894	50,997	109,932	48,750	145,000	72,500	310,000	205,000

Source: i) Department of Commercial Intelligence and Statistics, Calcutta

ii) Survey Estimates

ANNEXURE II

EXPORTS OF PROCESSED FRUITS AND VEGETABLES

Qty: Tonnes
Val: Rs '000

	1965-66(Act)		1966-67(Act)		1967-68(Prov.)		1970-71(Est)		1975-76(Est)	
	Qty	Val	Qty	Val	Qty	Val	Qty	Val	Qty	Val
Canned Fruits	89	251	131	506	151	566	900	2,280	67,200	124,700
Orange Segments	-	-	-	-	-	-	100	185	25,000	46,300
Pineapple Slices	-	-	-	-	-	-	100	170	15,000	25,500
Mango Slices	89	251	131	506	151	566	500	1,500	8,000	17,000
Peaches	-	-	-	-	-	-	-	-	10,000	17,000
Pears	-	-	-	-	-	-	-	-	5,000	8,500
Lychee Wholes	-	-	-	-	-	-	100	250	1,000	3,000
Grapes	-	-	-	-	-	-	-	-	1,000	3,000
Chickoos	-	-	-	-	-	-	-	-	200	400
Fruit Cocktails	-	-	-	-	-	-	100	175	2,000	4,000
Juices/Nectars	1,917	3,412	2,050	4,878	3,802	8,765	9,000	17,250	30,000	55,000
Mango	1,357	1,977	2,010	4,792	3,338	7,935	8,000	16,000	20,000	40,000
Others (Tomato, Orange, Pineapples, Guava, Peach, Apricot, Papaya, Lychee, Tropical Cocktails etc.)	560	1,435	40	86	464	830	1,000	1,250	10,000	15,000
Pulps and Concentrates	-	-	-	-	-	-	1,100	2,100	21,000	43,800
Mango Pulps *	-	-	-	-	-	-	500	900	5,000	9,000
Citrus Concentrates	-	-	-	-	-	-	500	1,000	5,000	11,000
Tomato Concentrates	-	-	-	-	-	-	100	200	10,000	22,000
Other Pulps (Papaya, Melon, Guava, Apricot etc.)	-	-	-	-	-	-	-	-	1,000	1,800

* Figures upto 1967-68 are included under Mango Juice/Nectar.

	1965-66(Act)		1966-67(Act)		1967-68(Prov.)		1970-71(Est)		1975-76(Est)	
	Qty	Val	Qty	Val	Qty	Val	Qty	Val	Qty	Val
Jams, Marmalades etc.	203	403	71	235	91	361	250	850	1,000	3,600
Mango Jams	164	333	51	178	76	280	150	450	600	1,800
Other Jams (Strawberry, Guava, mixed, orange, etc.)	39	70	20	57	15	81	100	400	400	1,600
Canned Vegetables	467	970	362	1,173	512	1,943	800	1,600	10,000	37,000
Peeled Tomatoes	-	-	-	-	-	-	-	-	5,000	11,000
Canned Mushrooms	-	-	-	-	-	-	-	-	2,000	20,000
Other Vegetables in air-tight containers	118	207	31	68	48	166	200	400	1,000	2,000
Others	349	763	331	1,105	464	1,777	600	1,200	2,000	4,000
Dehydrated Vegetables	11	28	3	19	1	8	20	70	2,600	9,100
Onions	-	-	-	-	-	-	-	-	2,000	7,000
Soup Powders	-	-	-	-	-	-	10	35	500	1,750
Others (Cabbage, Cauliflowers, Okra etc.)	11	28	3	19	1	8	10	35	100	350
Mango Pickles and Chutneys	1,582	5,143	1,709	4,257	1,389	4,087	2,000	5,000	3,000	7,500
Mango Slices in brine	548	613	273	615	149	249	1,000	1,500	2,000	3,000
Dried Mushrooms	25	1,817	34	2,539	18	2,169	30	3,000	50	5,600
Total (including others)	4,944	10,938	4,843	15,260	6,189	18,376	15,000	37,500	140,000	295,000

Sources: i) DGCI&S, Calcutta
ii) Survey Estimates

Annexure P

UNIT VALUE OF FRESH & PROCESSED FRUITS AND VEGETABLES

A. FRESH FRUITS

Unit Value:Rs Per Tonne

Product Group	1970-71 (Est.)	1975-76 (Est.)
Bananas	600	600
Mangoes	1,300	1,300
Citrus	1,000	1,250
a) Oranges	1,000	1,250
b) Limes & Lemons	1,000	1,250
c) Grapefruits	-	1,250
d) Others	-	-
Lychees	3,600	3,600
Grapes	2,000	2,000
Strawberries	4,000	4,000
Melons	2,000	2,000
Sapota (Chickoo)	2,000	2,000
Pineapples	1,000	1,000
Apples	3,000	3,000
Peaches	-	1,500
Apricots	3,000	3,000
Pears-Quinces	-	500
Papaya	2,000	2,000

B. FRESH VEGETABLES

Unit Value: Rs Per Tonne

Product Group	1970-71 (Est.)	1975-76 (Est.)
Onions	408	408
Potatoes	850	850
Seed Potatoes	2,000	2,000
Cabbages	750	750
Carrots, Turnips, Raddish, Knolkhol	500	500
Cauliflowers	1,500	1,500
Other Fresh Vegetables (Tomatoes, French beans, Aubergines, Capsicums, Okra, Tinda, Parwal, Karela, Salad Type Vegetables etc.)	1,071	1,000

C. PROCESSED FRUITS AND VEGETABLES

Unit Value: Rs Per Tonne

	1970-71 (Est.)	1975-76 (Est.)
Canned Fruits	2,200	1,855
Orange Segments	1,850	1,850
Pineapple Slices	1,700	1,700
Mango Slices	3,000	2,125
Peaches	-	1,700
Pears	-	1,700
Lychee wholes	2,500	3,000
Grapes	-	3,000
Chickoos	-	2,000
Fruit Cocktails	1,750	2,000
Juices/Nectars	1,945	1,830
Mango	2,000	2,000
Others (Tomato, Orange, Pineapple, Guava, Peach, Apricot, Papaya, Lychee, Tropical Cocktails etc.)	1,250	1,500
Pulps and Concentrates	1,890	2,085
Mango Pulps*	1,800	1,800
Citrus Concentrates	2,000	2,200
Tomato Concentrates	2,000	2,200
Other Pulps (Papaya, Melon, Guava, Apricot etc.)	-	1,800

* Figures upto 1967-68 are included under Mango Juice/Nectar

	1970-71 (Est.)	1975-76 (Est.)
Jams, Marmalades etc.	3,800	3,600
Mango Jams	3,000	3,000
Other Jams (strawberry, Guava, mixed, Orange etc.)	4,000	4,000
Canned Vegetables	3,000	3,600
Peeled Tomatoes	-	2,200
Canned Mushrooms	-	10,000
Other Vegetables in air-tight containers	2,000	2,000
Others	2,000	2,000
Dehydrated Vegetables	3,500	3,500
Onions	-	3,500
Soup Powders	3,500	3,500
Others (Cabbage, Cauliflowers, Okra, etc.)	3,500	3,500
Mango Pickles & Chutneys	2,500	2,500
Mango Slices in brine	1,500	1,500
Dried Mushrooms	120,000	120,000

Source: Survey Estimates

Annexure Q

PROGRAMME OF INVESTMENT FOR DEVELOPING EXPORTS OF INDIA'S HORTICULTURAL INDUSTRY BY 1975-76

	Rs. Million
1. Requirements of horticultural development for exports	
a) Outlay for intensive development of crops in existing areas (Irrigation, Plant Protection, Fertilizers etc. @ Rs 2,500 per hectare for 35,000 hectares)	85.0
b) Outlay for development of crops in new areas (@ Rs 5,000 per hectare for 15,000 hectares)	75.0
c) Outlay on auxiliary facilities	
i. Packing houses (10) @ Rs 250,000 each	2.5
ii. Warehousing and cold storage centres (15) @ Rs 500,000 each	7.5
iii. Refrigerated trucks (20) @ Rs 250, 000 each	5.0
iv. Air cooled wagons (50) @ Rs 200,000 each	10.0
d) Nurseries Bananas : Rs 4 million Pineapples : Rs 4 million Satsumas : Rs 4 million Others : Rs 3 million	15.0
e) Feeder roads, ropeways and necessary port facilities	10.0
2. Research and development	
a) Feasibility studies (10) @ Rs 500,000 each (including Tomatoes, Citrus, Deciduous Fruits, Pineapples etc	5.0

	Rs. Million
b) Assistance to research institutions for specific research programmes	35.0
c) Training of technical personnel in the existing institutions	
d) New training facilities - technical assistance programme on specific projects	
3. Investment requirements of processing industry	
a) Assistance to 10 selected units for modernisation, rationalisation, expansion etc	15.0
b) Setting up of new processing units	
i. Orange segments (2)	20.0
ii. Pineapple products (1)	25.0
iii. Citrus concentrates (1)	10.0
iv. Deciduous fruits (2) (Peaches, Pears, Apricots etc)	10.0
v. Tomatoes products (2)	15.0
c) Outlay on development of ancillary industry (packaging, machinery manufacture etc)	15.0
4. Export effort	
Trial shipments	40.0
Product testing and test marketing	
Consumer surveys	
Overseas offices	
Export Promotion	
Publicity	
	400.0

Source: Survey Estimates

Annexure R

LAND REQUIREMENTS FOR DEVELOPING EXPORTS OF INDIA'S HORTICULTURAL INDUSTRY BY 1975-76

Commodity	Present Total area (hectares)	Present Total Production (Tonnes)	Present exports (Tonnes) (1967-68)	Export Target for 1975-76 (Tonnes)	Area required for intensive cultivation of export varieties by 1975-76 target		
					Existing area for intensive cultivation of export varieties (hectares)	Additional area for intensive cultivation of export varieties (hectares)	Total area for intensive cultivation for export production (hectares)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Bananas	194,000	2,668,000	2,810 Fresh	100,000 Fresh	7,000	3,000	10,000
Mangoes	748,000	6,987,700	1,070 Fresh 13,000 Pro.	10,000 Fresh 55,000 Pro.	9,000	-	9.000
Oranges (Mosambi, Malta, Washington Navel, Shamouti)	24,400	278,200	169 Fresh 100 Pro.	10,000 Fresh 30,000 Pro.	1,500	2,500	4,000
Mandarins	43,500	473,800	-	50,000^{+} Fresh	Neg.	1,500	1,500^{+}
Limes	28,400	350,700	64 Fresh 200 Pro.	5,000 Fresh 20,000 Pro.	2,500	-	2,500
Lychees	NA	140,000^{0}		2,000 Fresh 2,000 Pro.	650	-	650
Grapes	NA	130,000*	3	1,500 Fresh 1,200 Pro.	100	300	400

+ Sastuma variety to be grown

0 Production of Bihar only

* Production in Mysore, Maharashtra and Andhra

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Strawberries	NA	NA	12,Fresh 10 Pro.	500 Fresh 200 Pro.	-	400	400
Lelons	NA	NA	-	2,000 Fresh 600 Pro.	1,800	-	1,800
Pineapples	7,800	75,650	5 Fresh	200 Fresh 30,000 Pro.	-	1,000	1,000
Peaches	1,250	7,400	Neg.	100 Fresh 14,000 Pro.	Neg	2,000	2,000
Apples	7,430	49,200	2 Fr.	100			
Apricots	1,500	8,400	3 Fr.	100 Fresh 3,000 Pro.	-	900	900
Pears	2,490	32,700	-	100 Fresh 6,000 Pro.			
Papaya	16,000	329,500	-	100 Fresh 2,500 Pro.	1,000		1,000
Potatoes	368,700	2,767,000	547 Fr.	10,300 Fresh 200 Pro.	1,000		1,000

(Contd...)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Onions	117,600	1,102,000	203,362 Fresh	150,000 Fresh 22,000 Pro.	10,500	-	10,500
Tomatoes	41,600	464	2 Fresh	50,000 Pro.	-	3,000	3,000
Total (including others)			109,932 Fresh 13,500 Pro.	310,000 Fresh 296,100 Pro.	37,300	16,000	53,300
			123,432	506,100	37,300	16,000	53,300

Source: Survey Estimates

COMMODITY REVIEW

4.1 BANANAS

A. Fresh Bananas

Background

Bananas occupy a prominent place in the international marketing of fruits, with well over 5 million tonnes representing 20 per cent of the world output entering the export markets. Bulk of these exports originate from countries of Central and South America and are directed towards North America and West Europe. Though bananas are cultivated on a large scale in countries like Brazil and India, they are largely absorbed in their domestic markets and do not figure prominently in their export trade.

Certain ecological and commercial factors have contributed to the concentration of production of bananas in the Central, South American and African countries. The development of Banana industry in the Central American countries is the direct result of large scale investment of finance and utilisation of modern techniques of production, handling and transportation. African countries such as Ivory Coast, Guinea and Somalia, on the other hand, have yet to reach the same operational efficiency, though they have been able to build up sizeable exports mainly on account of quota and tariff preferences extended to them by their metropolitan countries.

World Production

Banana, being strictly a tropical plant, is cultivated mainly in the regions lying between tropic of cancer in the north and capricorn in the south. In these regions again, the crop is localised in areas having fertile soils endowed with adequate irrigation (or rainfall) and drainage facilities

While statistics relating to banana production in different countries during 1964, 1965 and 1966 are provided in Annexure B-1, regional pattern of production in recent years is indicated below:

Production of Bananas by Regions

(Thousand Tonnes)

Regions	1964	1965
Europe	364	372
Central America	3,770	4,190
South America	10,090	10,400
Asia	6,390	7,200
Africa	1,150	1,100
Oceania	170	160
World Total incl. others	22,100	23,300

Central and South American countries account for two-thirds of the world output. Major producing countries in this region comprise Brazil, Ecuador, Venezuela, Honduras, Colombia, Panama and Costa Rica. In Africa, Malagasy, Somalia, Central African Republic and Ivory Coast are important producing countries. India is by far the major producer in Asia and, in fact, ranks as third largest producing country in the world.

Varieties. The main banana varieties cultivated for export purposes in different parts of the world include Gros Michel and Cavendish varieties such as Valery, Lacatan, Poyo, Giant Cavendish and Dwarf Cavendish, all of which belong to the botanical group Musa acuminata.

Gros Michel, until few years ago, has been the most extensively cultivated variety but, owing to its susceptibility to 'panama' disease, is being replaced by Cavendish varieties, particularly Lacatan and Valery. Both these varieties are high yielders (40 tonnes and 30 tonnes per hectare respectively) and enjoy a wide consumer acceptance in the importing countries of North America and Western Europe. Poyo, well known as Robusta, has been classified as Semi-Giant Cavendish variety and is cultivated in Somalia, Ivory Coast and other African countries. Dwarf Cavendish is yet another notable export variety, mainly grown in India, Israel, Egypt, Brazil and Canary Islands. Characteristics of these varieties are indicated below:

Varietal Characteristics of Bananas[1]

Characteristics	Gros Michel	Lacatan	Poyo	Giant Cavendish	Dwarf Cavendish
Height of the Plant (metres)	4-8	4-5	2.8-4	2.5-3.0	1.8 to 2.1
Shape of the bunches	Cylindrical	Cylinrical	Cylindrical	Truncated Cone	Truncated Cone
Fruit arrangement in the first hand of the bunch	3-4 upright	3-4 upright	1-2 upright	1-3 upright	Curved
Apex of the fruit	Pointed	Round	Round	Round	Round
Pedicelle of the fruit	Large	slender	slender	medium	medium
Vegetative cycle-from planting to harvest (months)	13-15	13-14	12	11	11

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[1] J. Champion 'LE BANANIER, GP Maisonneuve, 8, Larose, Paris 1963, p. 19.

Yields. Bananas are heavy feeders and respond well to intensive cultivation. Yields of bananas in different countries range from 13 tonnes per hectare in Honduras to 21 tonnes in Venezuela. Average yield obtained in India is about 14 tonnes per hectare which compared favourably with the other major producing countries. In concentrated areas of production such as Jalgaon in Maharashtra and Bardoli in Gujarat, the yields ranging from 25 to 30 tonnes per hectare are normally obtained.

World Trade

Between 1955 and 1966, world exports of bananas rose from 3.2 million tonnes to 5.4 million tonnes, representing an increase of about 70 per cent over the period. The upward swing was, in fact, impressive in 1965 and 1966 when the expansion in exports amounted to about one million tonnes or about 20 per cent over the level of 4.6 million tonnes in 1964. Apart from increasing availability of high quality bananas at competitive prices, growing use of cartons for export packing, which facilitate efficient handling and better presentation of the fruit at the point-of sale, has contributed to the sharp rise in the world trade during the recent two years.

Latin American countries dominate the world banana trade with a combined share of about 65 per cent. Ecuador alone supplies nearly 25 per cent of the world requirements and Honduras 10 per cent. Most of the other Central American countries hold sizeable shares in the world markets. Somalia, Ivory Coast and Cameroons constitute the principal supplying countries of Africa accounting for 15 per cent of the world exports. Taiwan and Canary Islands (overseas province of Spain) are the other important banana trading countries. Individual shares of these countries in world exports during 1955-57, 1961-63 and from 1964 to 1966 are given in Annexure B-2.

USA, UK, Scandinavian and ECM countries constitute the major consuming markets accounting for over 80 per cent of world imports. USA alone absorbs over one-fifth of the world imports (in terms of value) and EEC countries about one-third.

Japan and USSR have emerged, in recent years, as important consuming markets. Imports into Japan had increased from 43,000 tonnes in 1960 to 360,000 tonnes in 1965 under the stimulus of liberalised import policy followed since 1963. Detailed statistics of imports into different countries during the last decade are provided in Annexure B-3.

World Supply and Demand Projections for 1970

World export supply of bananas by 1970 has been estimated at 7.0 - 7.4 million tonnes[2]. This represents a rise of 30 to 37 per cent over the world exports of 5.4 million tonnes in 1966. Estimates of world demand in 1970 have been reckoned as follows:

At constant prices : 5.9 million tonnes
At 10% fall in real prices : 6.3 million tonnes
At 25% fall in real prices : 6.7 million tonnes
At 30% fall in real prices : 7.2 million tonnes

Break-up of import demand by consuming countries is given in Annexure B-4. In all these estimates, however, requirements of potentially large markets like USSR and East

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[2] FAO Monthly Bulletin, Vol. 16 No. 2, 1967

Europe have not been included. Total imports of bananas into East European countries, including USSR, were of the order of 65,000 tonnes in 1965. For a combined population of 330 million, this level of imports on a per capita basis amounts to only 330 gms. This is to be compared with average per capita consumption of 6.8 kg. in Western Europe, West Germany leading with 9.8 kg. followed by Switzerland with 9.5 kg. Average per capita consumption in Japan is about 3.5 kg. In this connection, it may be mentioned that Yugoslavia has nearly quadrupled its banana imports in 1967, amounting to 30,000 tonnes as compared to 8,000 tonnes in 1964. USSR, Czechoslovakia, East Germany are also reported to be stepping up their imports of bananas.

The following table gives the anticipated level of demand in 1970 in selected Survey countries.

Anticipated Import Demand for Bananas in 1970[3]

(Thousand Tonnes)

Countries	At constant prices	At 30% fall in prices
France	494	586
West Germany	650	796
Italy	328	426
Netherlands	94	112
Belgium-Luxemburg	87	102
United Kingdom	446	598
Sweden	70	82
Denmark	41	48

Contd....

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[3] FAO Estimates.

Countries	At constant prices	At 30% fall in prices
Norway	35	42
Switzerland	64	76
Yugoslavia[4]	50	-
Kuwait[4]	12	-
Babrain		

Protective Policies and Preferential Systems

A variety of preferential trade systems operate in the international trade of bananas, which are basically aimed at providing favoured positions to certain producing countries in the matter of access to the consuming markets. Implications of preferential measures adopted by major importing countries are briefly discussed below.

EEC Countries

EEC countries follow independent policies in respect of banana imports, as common trade arrangements are yet to be formulated. The present position obtaining in the member-countries is reviewed below.

France. France operates a quota system by which supplies from Franc Zone countries are allowed to enter the market duty free. Among the preferred suppliers, two-thirds of the quota are fixed for Antilles Departments and one-third for the Francophone countries of Africa (important among them being Malagasy, Guinea, Ivory Coast and Cameroons). A small quota is allocated to other associated countries not belonging to Franc Zone countries. In periods of short supply only, special quotas are allocated to third countries at external tariff rate of 20 per cent.

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[4] Projections estimated on the basis of discussions with the trade.

From the following table it will be evident that the major supplies to the French market are received from its associated territories.

Imports of Bananas into France

(Tonnes)

	1965	1966
Martinique	152,337	174,185
Guadelope	63,375	88,115
Ivory Coast	75,330	81,776
Cameroons	65,564	54,879
Malagasy	15,024	21,520
Guinea	2,596	N.A.
Surinam	1,690	3,951
Congo	2,227	3,842
Colombia	768	2,168
Ecuador	6,118	12,916
Total incl. others	399,283	458,692

Italy. Imports of bananas into Italy were operated by a State Monopoly until 1964. Under an agreement between Somalia and Italian Government, concluded in 1960, covering the period 1961-65, Italy was committed to absorb the entire exportable surplus of bananas from Somalia and thus gave a sheltered market for Somalian production. The State Monopoly was replaced in 1965 by a system of preferential allocation of import quota to Somalia and other associated countries. In 1966, import policy was further liberalised offering opportunities for third countries to enter the market provided their prices and quality are competitive. But Somalia and other associated territories were accorded preferential tariff and tax rates in order to provide them with a competitive edge in prices. The Italian banana market still remains controlled by means of global import quotas (300,000 in 1968) which are, however, allocated in a non-discriminatory manner.

Italian Preferential Tariffs and Tax Rates

Country	Tariffs	Consumer Tax
Somalia	Nil	60 lire per kg. ($ 97 per tonne). The concession is valid upto 100,000 tonnes
Associated Territories	Nil	90 lire per kg. ($ 145 per tonne)
Third Countries	20% ad valorem	90 lire per kg. ($ 145 per tonne)

In the wake of this liberalised but preferential policy, Italian market has been thrown open to the new suppliers and is being exploited by the South and Central American producers. This will be evident from the following table:

(Tonnes)

Countries	1964	1965	1966
Somalia	58,005	48,449	86,316
Ivory Coast	12,330	18,180	20,500
Israel	6,015	-	-
Antilles French	-	17,253	27,884

Contd...

Countries	1964	1965	1966
Colombia	-	-	27,107
Ecuador	-	11,009	78,371
Cameroon Republic	-	18,902	N.A.
Total incl. others	97,906	147,747	322,099

West Germany. Within the framework of EEC arrangements, West Germany is obliged to impose a common external tariff of 20 per cent ad valorem on bananas imported from the third countries. However, West Germany has been permitted duty free imports as per the provisions of agreement reached in the Yaounde' Convention in 1964. The duty free tariff quota amounted to 477,000 tonnes in 1964, 383,000 tonnes in 1965, 613,000 tonnes each in 1966 and 1967. Though associated territories are reported to be pressing for preferential treatment, indications are that West Germany will pursue "open door policy", until such time common EEC arrangements are agreed upon.

Benelux Countries. There are no quantitative restrictions on the imports of bananas into these countries. But former Belgium territories and Surinam enjoy 'nil' tariffs while the associated territories face 6 per cent duty and the third countries 18 per cent duty (as obtaining in 1967).

EFTA Countries. EFTA countries, except Switzerland, allow imports of bananas on a 'nil' or low tariff basis. In Switzerland, the import duty in 1967 was 21 per cent ad valorem. As for imports into UK, supplies from Commonwealth countries are allowed duty free, whereas those from third countries face an ad valorem duty of 14 per cent (7 sh. 6d per 100 cwt). Consequently, the two commonwealth countries - Jamaic and

Windward Islands - together meet more than 90 per cent of the requirements of the UK market.

Gulf Countries. Kuwait, Bahrain and other Gulf countries permit unrestricted and duty-free imports of bananas from all sources without any discrimination.

South-East Asia. Japan constitutes the main importer of bananas in this region. In 1963, Japan removed all quantitative restrictions on imports of bananas, but levied a high protective import duty of 70 per cent. The import duty was, however, reduced to 65 per cent in 1967 and indications are that it will be reduced further to 30 to 35 per cent in a year or two.

From the foregoing, it will be clear that despite tariff and quota barriers put up by various countries, opportunities still exist particularly in West Germany, Italy, UK, Japan and Gulf countries.

Methods of Banana Marketing

Integrated Approach. It has now come to be established out of decades of experimentation and tackling of practical situations that highly organised, integrated system of production and marketing is essential for ensuring profitable trade in commodities like bananas. Factors contributing to the need for such efficient organisation in this trade include high perishable nature of this commodity necessitating speed of movement from tho farms to the consumers, the specialised transportation requirements to keep the damage and spoilage to the minimum, and the relatively high investment needed in raising economically viable plantations It is also necessary to recognise the intense competition within and amongst the producing countries, each constantly endeavouring to satisfy the consumers by offering good quality bananas in most convenient forms and places. A few examples of development of integrated systems in certain producing countries would serve to highlight the modality of movement of bananas from producing areas to the marketing centres.

South and Central America. In South and Central American countries, two American companies (The United Fruit Company and The Standard Fruit Company) have made enormous investments for developing most economic means of mobilising production resources in order to derive maximum advantages accruing from sustained flow of supplies of requisite quality and shipment on predetermined time schedules to various markets, assiduously cultivated by them. These two organisations account for major part of banana exports from the South and Central American region.

Jamaica. Like many of the banana producing countries in Central American and Carribean regions, Jamaican banana industry is export oriented. On the average over 55% of the annual output of about 300,000 tonnes is exported, UK being its main market.

The significant feature of Jamaican banana industry is that production and exports of bananas are undertaken on an institutionalised basis with the active support and participation of the Government. Important organisations connected with this industry are The All Island Banana Growers Association and the Jamaica Banana Board.

The All Island Banana Growers' Association (AIBGA) was set up in 1946 with wide powers to promote and foster the general interests of the banana industry. It has 260 branches throughout the Island with field advisers in all producing districts. Its main functions include provision of technical advice, administration of subsidized production aids, and pest and disease control.

Under a scheme of financial aid, the Association provides loans to growers upto a maximum of $ 277 per hectare to plant bananas (provided approved cultivated methods are used). These loans are given for the rehabilitation and expansion of production on currently owned land, and not for the purchase of new land. Growers are granted interest free loans for the first eight months and are obliged to repay them over a three year period, payments to be deducted from proceeds of sale of fruit. AIBGA also administers the fertiliser credit scheme and subsidy programme under which all growers obtain fertiliser at reduced rates. The Memorandum of Association of the All Island Banana Growers' Association Ltd., appears at Annexure B-9.

The Jamaica Banana Board was established in 1953 in order to promote the interests and efficiency of the industry and to control the purchase, handling, shipping and marketing of bananas. It has statutory powers to conduct and assist research activities and administer such programmes as leaf spot control, although many of the technical functions are delegated by the Board to AIBGA. The Board has wide powers to carry on business transactions. The Board's functions, as laid down in its constitution (Annexure B-10), comprise,

(Next Page)

i) "Promoting the interests and efficiency of the banana industry of this Island and assisting in the development of that industry.

ii) "Securing the most favourable arrangements for purchasing, handling, shipping, marketing and selling of bananas, and purchasing of bananas for exports.

iii) "Instituting, conducting, financing, assisting and superintending research activities, experiments and operations -

  a) for improvement in the methods of planting and cultivation of bananas,

  b) for the control and elimination of any disease affecting bananas, and

  c) for the development of bananas wholly or partially immune to disease.

iv) "Controlling and fixing the prices, from time to time, to be paid to growers, producers or agents for bananas and arranging for these prices to be notified in such manner as the Board shall think fit."

Though the Board remains the centralised agency to purchase and market bananas, actual transportation and marketing of Jamaican bananas are effected by two companies - Elders and Fyffes Ltd., a subsidiary of United Fruit Company and Jamaica Producer's Ltd., a Jamaican company. These two companies market under contract to the Board and act as licensed agents.

Banana Board is also responsible for administering the Island's Banana Insurance Law (Annexure B-11). Growers, under this law, are statutorily insured against windstorm and hail damage. In the event of such a damage, the Board suitably indemnifies the growers.

Formation of a government sponsored Board appears to have provided the necessary fillip for the development of banana industry in the Island. Production has since increased from 222,000 tonnes in 1952-56, to 327,000 tonnes in 1965 and exports from about 120,000 tonnes to 202,000 tonnes during the same period. Under a programme sponsored by the Board, cultivators have completely switched over to disease-resistant Canvendish varieties in lieu of the traditional Gros Michel variety. Improved cultivation techniques, widespread application of fertilizers, scientific quality control (Annexure B-12) proper grading and processing and cartonisation of banana packing are some of the other notable achievements of the Banana Board in Jamaica.

Somalia. In Somalia, the banana industry is oriented towards exports with two-thirds of its annual output of 160,000 tonnes entering the export markets. The Noteworthy features of the Somalian industry are the existence of organised production groups in the form of two co-operatives, Viz, the Societa Anonima Cooperativa Agricola (SACA) representing the Afgoi-Genale area, and the Societa Agricoltori Giuba (SAG), composed of farmers from the Giuba region, and the collaboration they have established with the importing companies like ComeAfrique and Cogis of Italy for distribution of bananas and in the matter of technical assistance in improving the process of production. As a result of technical assistance provided by ComeAfrique, the co-operatives were able to switch over from growing Dwarf Cavendish to 'Poyo' variety which has a greater consumer acceptance. ComeAfrique also helped the SACA in building modern packing houses, facilitating efficient handling and packing of bananas. All these developments elevating Somalian banana industry to a competitive level have been achieved in a short period of two years. Detailed information with regard to Somalian banana industry is provided at Annexure B-5.

Martinique: An example of cooperation between growers and exporters leading to successful marketing of bananas is provided by SICABAM, an association of banana growers and UNIBANA, a consortium of six exporters in Martinique. Establishment of SICABAM brought about coordination among the growers and facilitated collective marketing of production of the members through UNIBANA. The consortium handles about 90,000 tonnes of bananas annually. Noteworthy achievements of the co-ordinated effort include (a) lower freight rate obtained under lumpsum contract, (b) adoption of an efficient export policy for sale of surpluses to countries other than France and creation of a pool fund to compensate price differences necessary to make the sale, (c) standardisation and improvement of quality of Martinique bananas and (d) smooth flow of supplies and stability in prices.

Ivory Coast. Banana industry in Ivory Coast is run on institutionalised basis. Production functions upto shipping stage are performed by 'Cooperative Bananiere et Fruitiere de Cote d' Ivoire' (Banana and Fruit Growers Cooperative Society) which has a membership of 800 growers. The members of the society are responsible for an annual output of 150,000 tonnes representing almost the entire production of Ivory Coast. Annual exports are about 130,000 tonnes.

The Society has established a 'selling arrangement with an importers' consortium in France called 'Organisation Commerciale de la Production Bananiere' (OCP) in which, the Society holds 60 per cent share interests. OCP is entrusted with three functions, viz., (i) transportation of bananas from Ivory Coast to importing countries in its own fleet of banana boats; (ii) arrangements for ripening and distribution of bananas and (iii) fixation of delivery prices. In addition, OCP provides requisite information on market trends to the Society so as to orient its production programmes to suit the consumer requirements. For example, on the advice of OCP, Ivory Coast producers gradually replaced Gros Michel variety with the Poyo variety since 1963.

In order to have a broad based market operation, OCP deals with bananas from Ivory Coast and other sources like Somalia, Honduras, Ecuador, Martinique, Guadeloupe, and Canary Islands through its affiliated companies like ComeAfrique and Union Bananiere Algier (UBA).

Canary Islands. Production of bananas in Canary Islands is carried on in small holdings, averaging less than one hectare. However, co-operative marketing is exceptionally vigorous and covers about 38% of the present total output of 435,000 tonnes of bananas. While marketing of bananas within the Islands and in Spanish Mainland is handled directly by the co-operatives and private firms, foreign sales are negotiated by CREP[5/], an organisation run by the representatives of co-operatives, exporters and other interests concerned with the banana industry. Though the cooperatives and exporters are free to make their own export arrangements, it has been

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[5/] Regional Organisation of the National Syndicate of Fruits and Vegetables of Spain found to be more advantageous to let CREP handle all exports in view of the difficult competitive situation obtaining in the European markets.

CREP is managed by a Regional Commission comprising 20 members, 14 representing cooperatives and exporters, and four representing the official quality control organisation 'SOIVRE The Chairman of the National Syndicate of Fruit and Agricultural Produce, who is nominated by the Government, also acts as the Chairman of the CREP. The main functions of the CREP are:

i) It controls the flow of supplies of bananas to domestic and export markets by allocating sales order to the cooperatives, private dealers and agents. The payment to individual farmers and members of the cooperatives is made on the basis of average prices obtained in Spanish and foreign markets. This system of payment eliminates the possible attraction that home or foreign markets may offer in the matter of prices, in a given period of time.

ii) It supervises all the operations of handling the fruit from bunch cutting to the loading on the ships, imposing appropriate penalties, whenever necessary. It also collaborates with official quality control organisation (SOIVRE) in inspection of bananas intended for exports.

iii) It takes care of freight charges with respect to shipments to Spain, charging the cooperatives and exporters on a pro-rata basis.

iv) It undertakes publicity when considered desirable.

To meet the operating expenses, CREP charges a levy of 0.05 pesatos per kg. and pays back any surplus to the cooperatives and exporters at the end of each year.

Details of various aspects of Canary banana industry are given in Annexure B-6.

Philippines. The Standard Fruit Company, a subsidiary of Cassell and Cooke of USA, commenced its operation of developing an organised banana industry in Philippines in 1965, with the main objective of mobilising production for exports to Japan. The potential of Japan as a growing market will be evident from the fact that imports of bananas into Japan are forecasted to rise from the present level of 450,000 tonnes to 750,000 tonnes in the next five years. Having already secured 10 per cent share of the Japanese market by exporting bananas from Ecuador and Guatemala, the Standard Fruit Company hope to consolidate and obtain a greater share by arranging supplies from nearby source like Philippines.

The Standard Fruit Company have so far invested in Philippines $ 3 million and have plans to expand the operations with an additional investment of $ 5 million in the next few years. About 1,400 hectares have been brought under banana cultivation in the coastal region of Cotabato, where Giant Cavendish is being grown. Although 70 per cent of these plantations are owned by private farmers, the company exercises complete control on the production operations. The entire production of the growers is to be made available to the company at a fixed rate of 5 Pesos per cwt. for a period of ten years, under a contract entered into with them. The company have their own banana boats for transportation, which will take just 4 days to reach the Japanese shores, as against 12-15 days normally taken from their Central American supply points to Japan. Cardboard cartons are expected to be used for packing bananas, each box containing five to six hands, weighing roughly 10 kg. Harbour facilities have already been developed by its sister company Dole Philippines Inc. and the port is hardly at a distance of three miles from the banana plantations.

The Company has also worked out tie-up sales arrangements with Japanese brokers and have registered their brand name 'Cabana' in Japan. The first shipment is expected to take place in August 1968.

Channels of Distribution

In view of the high perishable nature of the commodity, considerable emphasis is laid on speed of movement not only from the production centres to the ports of discharge in the importing countries but also in the further distribution to the ultimate consumers. The magnitude of the problem can be illustrated as follows. The illustration is only indicative of the normal trade channels and time dimensions involved in respect of distribution in European markets.

GROWERS/GROWER'S ORGANISATION	
36 hours	Say 3,000 growers or 2 or 3 growers' Organisation
COLLECTION AGENTS	
36 hours	Say 50 agents
PORTS-LOADING	
12 to 14 days to Europe	Movement in Banana Boats; Frequency of Loading, say weekly
PORTS UNLOADING	
12 to 24 hours	Say 2 or 3 importers
RIPENERS - WHOLE SALERS	
6-9 days	Say 100

Contd...

RETAILERS

2-3 days | Say 10,000

CONSUMERS

| Say 1,000,000

It may thus be seen that normally no more than thirty days are taken to complete the entire distribution operations, with a large number of agencies functioning in perfect coordination. Another distinctive feature of the trade is that bulk of exports are usually handled by a few large firms. For example, in UK, Elders and Fyffes, Geest Industries and Jamaica Producers Marketing Company handle about 90 per cent of the banana imports in the ratio of 40 per cent, 40 per cent and 10 per cent. Likewise, in Italy, Compagnie Italiana Della Frutta (subsidiary of the United Fruit Company), Cogis and ComeAfrique account for 90 per cent of the total imports, with their respective individual shares being about 40 per cent, 30 per cent and 20 per cent. In West Germany, Harder & Miser alone is responsible for 60 per cent of the total imports.

The United Fruit Company and the Standard Fruit Company either have their own distribution organisations in the consuming markets or operate through sole selling agencies (e.g. Harder & Miser in West Germany and Migros in Switzerland). More commonly practised system, however, is that of importing firms entering into annual/biennial contracts with growers' or trading organisations for supply of agreed quantity and quality of bananas at a fixed price. In these cases, the contracts also stipulate, inter-alia, time and periodicity of delivery of supplies. A specimen contract entered into between an Italian firm and a group of Ecuador growers is given at Annexure B-7.

Prices

Banana prices are heavily influenced by packing, transport and distribution costs, besides qualities and grades. The prices at which imports are effected into different countries vary according to the sources of supply, depending on the type of arrangements agreed upon between the importers and exporters. Average c.i.f. prices prevailed in selected markets during January-March, 1968 are indicated below:

Buying Country	Exporting Country	Average CIF Price ($ per Tonne)
West Germany	Ecuador	145-150
	Colombia	125-130
UK	Jamaica	145-150
Italy	Ecuador	125-35
	Somalia	155-160
France	Martinique	210-215
	Ivory Coast	160-170
Yugoslavia	Israel	130-140
	Guinea	160-165
	Ecuador	130-145
Greece	Israel	140-145
	Ecuador	165-170
Japan	Philippines	110-120
	Taiwan	165-170

Information gathered during the survey has revealed the following cost estimates of banana exports from selected supplying countries.

(Next Page)

($ per Tonne)

	Orchard Price	FOB Price (excluding cartons)	Cartons	Ocean Freight & Insurance	Other Exports	Total CIF
Somalia to Italy	40	60	25	64	6	155
Ecuador to Italy	30	50	22	55	8	135
Ecuador to West Germany	40	60	22	55	8	145
Ivory Coast to France	50	74	26	50	15	165
Jamaica to UK	45	64	25	54	7	150
Philippines to Japan	30	42	20	45	10	120

The differences in f.o.b. prices reflect the costs of production in the above-mentioned countries. FOB prices are generally found to be higher in the case of countries like Ivory Coast, Jamaica and Somalia which enjoy the benefit of sheltered markets in their metropolitan countries.

It may be noted that approximately 30-37 per cent of the c.i.f. price is accounted for by ocean freight & insurance and about 15-17 per cent by cost of cartons used for packing bananas. Assuming f.o.b. expenses at about $ 10 to 15 per tonne, the producer's prices may be reckoned at 25 to 30 per cent of the c.i.f. prices.

Brand Publicity

Brand publicity constitutes an important marketing strategy for promoting sales of bananas, following the aggressive promotion campaign initiated by the United Fruit Company since 1963 for its brand 'Chiquita'. The publicity measures include affixing brand labels on the fruit, display of hoardings, posters etc. at the point-of-sale and extensive advertising in trade journals. In West German market alone, the United Fruit

Company is reported to be spending annually about one million dollars for popularising 'Chiquita' bananas in recent years. Similar publicity efforts are being made by other competing suppliers, and brands like Sundrop (Colombia), Payela (Ecuador), Unibana (Martinique), and Somalita (Somalia) have become popular in the European markets.

Packing

Bananas are normally packed in cartons containing about 12 kg nett in 12 to 15 hands. Cartons used by the leading suppliers are well ventilated and are strong enough for stacking 6-10 high.

Transport

In view of the highly perishable nature of bananas, it is essential to ensure their speedy movement from the production points to import markets. Major suppliers of bananas like Ecuador, Honduras and Ivory Coast ply their own banana boats equipped with horizontal cooling system with capacities ranging from 2,000 to 5,000 tonnes and speeds between 16 and 21 knots and upward. Chartering of banana boats by leading export countries on a long term basis is also a common feature. In the contracts entered into between the suppliers and importers, specific clauses are invariably provided with respect to the shipping arrangements.

India's Position

Banana industry in India is domestic market oriented and only in recent years efforts have been made to exploit the export potential. In comparison with the high degree of production and marketing efficiency achieved in the Central and South American countries, position obtaining in India should be regarded as far from satisfactory, especially in the spheres of handling, packaging and transportation. However, India is situated in the banana belt of the world and abounds in areas having ideal ecological conditions for its cultivation. This basic advantage needs to be utilised for building up efficient banana industry in India.

Production. Recent trends in production of bananas in the country are indicated in the following table.[6]

	Area (Thousand Hectares)	Production (Thousand Hectares)	Yield per Hectare (Tonnes)
1961-62	165	2,257	13.68
1962-63	189	2,425	13.41
1963-64	193	2,601	13.50
1964-65	198	2,684	13.56
1965-66	201	2,693	13.36
1966-67 (Est.)	207	2,800	13.50

It may be seen that there has been a moderate but steady increase in production from 2.26 million tonnes in 1961-62 to 2.8 million tonnes in 1966-67. This was mainly due to increase in the crop area rather than through higher productivity, as the yield per hectare remained at around 13.50 tonnes during the period under review. In concentrated areas of commercial production such as Jalgaon in Maharashtra, North Arcot in Madras and Bardoli in Gujarat, yield ranging from 12 to 18 tonnes per acre or 30 to 40 tonnes per hectare is obtained. There appears to be scope for attaining higher crop yields even in these areas by better crop management and intensive cultivation. Higher productivity will be of vital importance for keeping the cost of production as low as possible. This aspect needs particular attention when schemes for organising production for export are formulated.

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[6] Directorate of Economics and Statistics, Government of India

Areas of Production. Bananas are grown in almost all parts of the country under varied soil and climatic conditions. Its production, however, is concentrated in the coastal States of Maharashtra, Kerala, Gujarat, Madras, Andhra Pradesh, Mysore and West Bengal. It is also cultivated extensively in Bihar and Assam. Statewise break-up of the area and production for 1962-63 is given below.

Statewise Production of Bananas in India[7]
(1961-62)

State	Area (Hectares)	Production (Thousand Tonnes)	Percentage share in total Production
Madras	29,821	547	26.3
Maharashtra	15,963	393	18.9
Kerala	43,590	240	11.5
Bihar	13,426	187	9.0
Andhra Pradesh	8,168	167	8.0
Gujarat	4,623	149	7.2
Assam	13,201	118	5.7
West Bengal	7,606	116	5.6
Mysore	16,675	85	4.1
Tripura	4,675	45	2.2
Others	7,666	31	1.5
Total	165,414	2,078	100.0

Directorate of Marketing and Inspection, Government of India.

Varieties. There are more than 60 varieties of banana under cultivation in India. But only a dozen of them are of commercial importance which include Poovan, Basrai, Harichal, Nendiran, Rasthali, Safed Velchi and Monthan. Quality characteristics of these varieties appear at Volume II, Annexure A-5. Harichal and Basrai belonging to Cavendish group, have been tried for exports to Gulf countries and USSR. These varieties are at present grown in Bardoli area of Gujarat and Jalgaon area of Maharashtra. Estimated Production of these varieties during 1966 was of the order of 700,000 tonnes. The main period of harvest is spread over from September to January, though through adoption of judicious irrigation and manurial practices, it is possible to obtain harvests from June to August as well. In other words, the period of availability of supplies can be extended from June to January.

It may be mentioned that a Descernible trend is noticeable in all the major producing countries to cultivate other Cavendish varieties like Lacatan, Valery, Poyo and Giant Cavendish in preference to Gros Michel and Dwarf Cavendish. As stated earlier, these varieties have gained wide consumer acceptance in the importing countries of North America, Europe and Japan. Hence there is need to introduce these varieties in India through a phased programme.

Cost of Production. Data collected during the field survey in India revealed that cost of production per acre ranged from 1,800 to 2,000 (Rs 4,500 to 5,000 per hectare) depending upon the varieties grown and the extent of attention devoted to the cultivation of the crop, as may be seen from the tables given below.

(Next Page)

Average Cost of Production of Bananas
(Per Acre)

Bardoli Area in Gujarat		Rs
Cost of seedling and planting		150
Manures and Fertilisers		1,000
Irrigation		450
Labour		250
Land lease		150
Total	Rs	2,000
	(Rs	5,000 per hectare)

Average yield - 15 tonnes per acre
(37 tonnes per hectare)

Kerala

Preparation of land	21
Making pits	132
Suckers at 37 paise each	296
Planting	32
Inter-cultivations - 2 times	150
Opening irrigation channels	40
Cattle manure and compost - 10 tonnes per acre at Rs 20 per ton	200
Green manure - 4 kg per plant	230
Fertiliser mixture - 2 kg per plant	640
Application of manures - labour charges	70
Props	150
Labour charges for typing props	40
Price of coir for tying	24
Irrigation for the whole season - labour charges	100
Irrigation for whole - season-current charges	30

Contd...

	Rs
Plant Protection measures	50
Harvesting expenses	35
Watchman for two months	60
Total	Rs 2,300
	(Rs 5,520 per hectare)

Average yield - 400 bunches per acre

North Arcot in Madras

Preparation of field and planting	390
After cultivation	670
Application of manures	170
Weeding	115
Irrigation	400
Harvesting and other expenses	50
Total	Rs 1,800
	(Rs 4,320 per hectare)

Average yield - 14 tonnes per acre
(35 tonnes per hectare)

Prices. Following were the average prices for bananas in Bombay market during 1966 and 1967 (Details are available at Volume II, Annexure A-25).

(Rs per Quintal)

	1966	1967
Main Season (October to February)	23.25 to 29.40	25.50 to 40.75
Low Season (March to August)	32.20 to 40.50	32.50 to 47.15

Indian prices appear to compare favourably with the average farm gate prices of $ 30-35 (Rs 235 - Rs 263) per tonne obtaining in major producing countries, without taking into account the quality considerations.

Exports. Recent trends of banana exports from India are indicated below.

Banana Exports from India

Year	Quantity (Tonnes)	Value (Rs Million)
1961-62	7,082	1.98
1962-63	11,269	3.18
1963-64	10,731	3.60
1964-65	8,396	3.16
1965-66	8,931	3.77
1966-67	8,062	3.73
1967-68	2,813	1.93

The Gulf countries and USSR are the main export markets, at present. While exports to Gulf countries are effected by Gujarat State Cooperative Fruit and Vegetable Marketing Federation and Jalgaon Banana Cooperative Marketing Federation on a monopoly basis, exports to USSR are handled by the State Trading Corporation of India Ltd (STC). After initial set-back in the export of bananas to USSR, the procedure of procurement, packaging and shipment was streamlined resulting in better export performance. Details with regard to the various shipments of bananas effected to USSR are provided at Volume II, Annexure A-21.

Banana and Fruit Development Corporation (BFDC) sponsored by the four Southern States (Madras, Mysore, Andhra Pradesh and Kerala) have been also making attempts to organise exports of bananas to Japan. The BFDC has also worked out a scheme for raising about 5,000 acres (1,235 hectares) under Cavendish variety in South Canara district of Mysore with a view to channeling the production for exports. According to the scheme, the Government of Mysore would undertake technical supervision of cultivation of bananas and supply necessary inputs and the Syndicate Bank Ltd., Manipal, would furnish necessary loans to the growers. The BFDC would assume the responsibility of marketing bananas of standard quality produced by the growers and pay a price at the rates mutually agreed upon prior to planting, and arrange to recover the loan amount due to the Syndicate Bank from the sale proceeds. Obligations to be discharged by the participating parties concerned are laid down in the form of legal agreements. Drafts of the agreements are given at Annexure B-8. The progress achieved so far in the implementation of the Scheme, however, has not been appreciable.

Prospects for India

Based on the assessment of market opportunities for bananas in the Survey countries and on such indications as are available in respect of market potential of Japan and East European countries including USSR, prospects for Indian bananas can be indicated as follows.

i) Inspite of restrictive trade policies being practised by the major importing countries, market opportunities for Indian bananas are not totally lacking. The open-door policy of West Germany, UK and Scandinavian countries provide scope for India's entry into these markets.

ii) Geographical proximity confers decided advantage to India in relation to Gulf countries and Japan, whose import potential is considerable.

iii) East European countries including USSR have been evincing increasing interest in import of bananas in recent years. India has a better access to these markets in view of the existence of bilateral trade agreements.

Considering market prospects indicated above, it seems clear that India would do well to develop this industry on a priority basis and create a strong export sector. The main plank of developmental strategy must, however, rest on the building up an efficient and competitive industry.

Export Target. Based on the data collected during the Survey and against the background of the projected import demand of the major importing countries and also taking into account the need for developing an optimum banana industry in India, estimates of export prospects for Indian bananas by 1975-76 have been worked out as follows.

Market	Export Prospects for India (Tonnes per annum)
Japan	50,000
West Europe[8] (mainly West Germany, Italy and Belgium)	20,000
USSR[8]	15,000
Yugoslavia[8]	8,000
Gulf countries	7,000
Total	100,000

For expansion of exports envisaged above, the following measures will need to be taken in the spheres of production and export marketing:

i) Organisation of production of suitable varieties in selected areas near port towns;

ii) effective control at different stages of production, harvest, and procurement;

iii) creation of facilities for grading and packaging;

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[8] Contingent on opening of Suez Canal.

iv) safe and efficient handling from the point of harvest to the point of delivery overseas;

v) suitable agreements with the foreign buyers.

These measures necessitate consideration of the major question of development of a suitable organisation which would be in a position to marshal the required resources, develop the requisite competence and expertise for effectively competing in the world markets. The organisational development in India at present, in relation to the banana industry, is inadequate for meeting these requirements. The organisations dealing with the production and marketing of bananas are: Banana Fruit and Development Corporation, Gujarat State Fruit and Vegetable Marketing Federation and Jalgaon Banana Cooperative Marketing Federation. The activities of these organisations have been dealt with in the report. The State Trading Corporation is another agency which has been exporting bananas to USSR. Although these organisations have been endeavouring to expand banana exports, their efforts have been inadequate and sporadic and have not taken into account the need of a comprehensive approach which is inevitably required for building up a large production base for mounting the export effort.

Organisational Development

It is necessary that for the development of banana industry and for expanding exports of bananas, there should be one all-India organisation which should concern itself with the entire range of problems of this industry from the stage of production to export marketing. This organisation which may be called the Banana Development and Export Corporation should be set up on commercial lines. Initiative for establishing this organisation should be taken by the

Ministry of Food and Agriculture and the Ministry of Commerce, Government of India in consultation with the states which have interest in the production and exports of bananas. The Corporation should be developed in such a manner that the existing organisations could be merged into it by participating in share capital. It will be desirable to secure association of all producers; the association of cooperatives of producers should receive preference.

Following are some of the major functions which would need to be undertaken by the proposed Corporation.

i) Organisation of field tests for determining the appropriate varieties which will be most suited for cultivation in the respective areas from the point of view of exports;

ii) Selection of suitable areas for development of production;

iii) Establishing rapport with the cooperatives of growers as well as individual growers for securing supplies on long-term basis;

iv) Providing technical guidance in the matter of scientific cultivation, transport and handling of the fruit;

v) Setting up of packing houses and creation of necessary infrastructure (feeder roads), transportation, ropeways, etc.);

vi) Provision of necessary inputs, financial assistance and credit to the growers' cooperative and growers;

vii) Manufacturing and use of the right type of carton for packaging of bananas;

viii) Chartering of banana boats on longer term basis for keeping up the delivery schedules and to achieve overall economy in ocean freight;

ix) Execution of sales agreements with selected foreign buyers and countries;

x) Effective promotion and publicity measures.

It will be observed that the objective for establishing the proposed Corporation would be to put together the various sectors and operations relating to this industry including cultivation, processing, packaging, transportation, marketing and financing, utilising the latest developments in research, technology and methods & systems for developing a viable banana industry in the country.

Short Term Measures

Pending the consideration and implementation of the long-term programme detailed above, the following short-term measures are suggested:

i) As Dwarf Cavendish variety is acceptable in the Gulf countries and USSR (in the short run) India should try to expand its exports to these markets.

ii) It has been suggested by the trade in Kuwait and Bahrain that India should adopt packaging of banana bunches individually in paper bags as is being done by Somalia. This suggestion needs immediate consideration.

iii) India has not so far made any attempt to enter the growing market of Yugoslavia. In this market, Dwarf Cavendish varieties will be acceptable, in the short run. Trading enterprises contracted during the survey evinced interest in securing supplies of bananas from India. The State Trading Corporation of India should initiate action to tap this potential.

iv) It has been reported that recent trial shipment of bananas to Japan (December, 1967) had resulted in heavy discount in prices owing to discolouration of fruits, rotten or broken neck, stemrot in hands and spreading of the fingers (called 'Octopus' hands). A thorough study needs to be instituted with a view to finding out ways and means for preventing recurrence of such problems in future.

B. Banana Products

Background

Banana powder, chips, dried figs, canned slices, banana puree and cocktail constitute the main processed products of bananas. Volume of production and international trade in respect of these items is at present insignificant. Faced with the problems of surplus production of bananas, countries like Ecuador, Dominican Republic and Brazil have been making attempts in recent years to develop large scale banana industries. They have not made much progress so far in view of the difficulties encountered in finding market outlets for the processed banana products. Reasons for limited market potential of these products have been attributed to i) easy availability of fresh bananas at reasonable prices limiting the scope for marketing banana products and ii) availability of cheap synthetic banana flavours which find use in making ice creams, custard powder etc.

World Trade

Banana puree and banana figs are reported to be the main banana products having some export potential. Available information indicates that USA imports annually about 3,500 tonnes of banana puree, mostly from Dominican Republic. Outside USA, demand for this item appears to be limited.

Total world trade in banana figs is estimated[9/] at about 2,000 tonnes, with Ecuador accounting for over 90% of this trade. The main markets for this product include West Germany, Japan, Switzerland and France. Export trade in other banana products are negligible.

India's Position

Jalgaon District Co-operative Society in Maharashtra

[9/] Report on Banana Products, Tropical Products Institute, London, 1967 has set up a modern banana powder plant at a cost of over one million rupees in 1964. It is yet to commence production on a commercial basis. There are two other units - one in Madras and another in Kerala - manufacturing banana powder. They have recently introduced their products in the internal market. Information gathered during the Survey indicate that West Germany offers some prospects for this item. It is also understood that Japan constitutes another potential market. A detailed market survey should be undertaken in West Germany and Japan for tapping the potential for banana powder.

C. RECOMMENDATIONS

Following specific measures will need to be taken in the spheres of production and export marketing for expanding the exports of bananas and related products:

i) Considering the complexities involved in the fields of production, processing, packaging, transportation and marketing of bananas, a suggestion has been made for the creation of Banana Development and Export Corporation, for developing banana industry in India and organising exports on a sustained basis. The functions of the proposed Corporation will include:

   a) Organisation of production of cavendish varieties like Lacatan, Poyo and Valery through a phased programme in the selected areas of the country

   b) Creation of the necessary infra-structure for handling, grading and transportation of bananas (setting up of packing houses, feeder roads, ropeways, etc.)

   c) Provision of necessary inputs and financial assistance to growers

   d) Promotion and publicity.

ii) Pending the development of Cavendish varieties of bananas like Lacatan, Valery and Poyo, it is recommended that attempts have to be made to accelerate exports of the Dwarf Cavendish varieties to Gulf Countries, Yugoslavia, USSR and Japan, which are receptive to these varieties, at present. In this connection, it has been suggested to institute studies for preventing recurrence of problems such as discolouration of fruits, rotten or broken neck, stem-rot in hands and spreading of the fingers.

iii) Considering that West Germany and Japan constitute the main markets for processed banana items, it is recommended that detailed market surveys should be undertaken with a view to tapping the potentials of these markets for Indian banana powder and figs.

4.2 CITRUS

A. Fresh Citrus

Background

Citrus fruit constitutes one of the most important horticultural crops entering the world trade, principal producers being USA, Brazil, Spain, Japan, Italy, Israel, India, Morocco, Algeria and South Africa.

Though the production of citrus has spread to many parts of the world, commercial cultivation of the fruit is limited to certain geographical areas, where specific favourable climatic conditions obtain. In North America, for instance, where high potential for agricultural production exists, citrus can be grown only in comparatively small areas of California, Arizona and Florida. Likewise in Spain it is only in the narrow strip along the eastern coast around the province of Valencia that soils and climatic conditions are ideal for citrus production.

Species and varieties of citrus fruit are classified into three groups: (i) oranges, mandarins, tangerines, clementines, satsumas and similar types, (ii) lemons and limes, and (iii) grapefruits. According to the FAO, the first group accounts for about 80% of the total world citrus output while lemons and grapefruits make up the remainder with almost equal shares.

Of the total output of 27 million tonnes about 4 million tonnes of fresh fruit enter world trade annually. Spain, Israel, Morocco, South Africa, Italy, USA, Algeria, Brazil, Lebanon and Greece constitute the most important exporting countries in the world, currently earning well over $ 500 million a year.

The potential demand for citrus is considered unlimited, though saturation point of consumption has reportedly been reached in some countries like U.K. In Western Europe, for instance, annual per capita consumption of citrus fruit ranged between 15 to 20 kg in 1965 as against 4 to 8 kg in the East European Countries. Trends in citrus consumption have been upward in most of the countries of the world, as would be indicated from the table given below:

Index of Per Capita Consumption By Regions [1]

(1965)

(1930 : 100)

Scandinavia	550
USA	380
ECM countries	300
UK	150
Mediterranean	150

It is evident that whereas the consumption in Scandivania, ECM countries and USA rose rapidly over the period, Mediterranean countries and UK marked a relatively lower rate of growth. In a number of developing and under developed countries, citrus fruit is consumed in very small quantities conditioned by high prices, though the current rate of expansion in production is a pointer towards the ever growing consumption potential.

1/ Citrus in Israel, Yehuda Chorin, Israel Periodicals, Tel Aviv, 1966.

World Production

The total world crop during 1966 has been estimated at 27 million tonnes comprising 21.3 million tonnes of oranges and tangerines, 2.9 million tonnes of lemon and limes and 2.3 million tonnes of grapefruits. While principal producers of oranges and tangerines include USA, Brazil, Spain, Japan, Italy, India and Israel, lemons and limes are grown mainly in USA, Italy, India, Greece, Spain and Turkey and grapefruits in USA, Israel, Argentina, South Africa, Syprus and Jamaica. While detailed statistics on the world production of citrus fruit are given at Annexure C-1, the following table presents the production of different kinds of citrus fruit in major countries during 1961-65

Production of Citrus Fruits in Major Countries[2/]

(Thousand Tonnes)

	1961	1963	1965
Oranges and Tangerines			
USA	5,650	3,709	5,648
Brazil	1,918	2,280	2,485
Spain	1,838	1,976	1,921
Japan	1,060	1,113	1,554
Italy	927	1,066	1,175
India	752	750	780
Israel	604	668	800
Morocco	444	471	510
Total (including others)	18,834	18,496	21,321

[2/] Monthly Bulletin of Agricultural Economics and Statistics, FAO, Rome, September 1966.

	1961	1963	1965
Lemons and Limes			
USA	631	710	625
Italy	550	552	602
India	440	450	450
Greece	143	140	98
Spain	121	106	194
Turkey	63	71	78
Japan	50	52	71
Argentina	87	89	70
Total (including others)	2,718	2,905	2,931
Grapefruit			
USA	1,521	1,249	1,718
Israel	69	98	162
Argentina	40	50	72
India	20	20	20
Total (including others)	1,891	1,714	2,300

World production of oranges and tangerines on the one hand and grapefruits on the other has shown an impressive rise. India, it would be seen, constitutes the third important producer of limes, accounting for over 15% of the total world production of lemons and limes.

Utilisation and Consumption. The Survey has revealed that a major chunk of the total crop is consumed in the citrus growing countries, leaving relatively small quantities for exports, as shown below:

(Next page)

Average Utilization of Citrus Fruit in Major Regions (1960/61 - 1962/63) 3/

(Thousand Tonnes)

Continent and Country	Production	Consumption			Per Capita		
		Fresh	Processed	Total	Fresh	Processed	Total
North and Central America	8,191	3,687	4,174	7,861	13.6	15.3	29.2
United States	6,840	2,283	3,825	6,108	12.5	21.4	33.9
Canada	-	246	330	576	13.6	18.1	31.7
Others (Est.)	1,351	1,158	19	1,177	16.6	0.4	17.0
Mediterranean Region	5,953	2,791	315	3,106	14.6	1.6	16.2
Greece	401	282	24	306	33.6	2.9	36.5
Italy	1,269	721	65	786	14.4	1.3	15.7
Spain	1,665	492	184	676	16.1	6.0	22.1
Libya	21	19	-	19	15.6	-	15.6
Cyprus (Est.)	70	16	1	17	27.7	1.7	29.4
Israel	595	103	19	122	46.9	8.2	55.1
Lebanon	186	83	-	83	45.1	-	45.1
United Arab Republic	316	307	-	307	11.9	-	11.9
South America	4,129	3,845	40	3,885	26.1	0.3	26.4
Argentina	826	764	15	779	36.7	0.7	37.4
Brazil	2,108	1,897	25	1,922	26.4	0.3	26.7
Others (Est.)	1,195	1,184	-	1,184	21.6	-	21.6
Africa (excl. Mediterranean)	636	280	46	326	1.4	0.2	1.6
South Africa, Rep. of	476	145	37	182	8.9	2.3	11.2
Others (Est.)	160	135	9	144	0.8	-	0.8
World Total (incl. China Mainland)	21,867	16,605	5,184	16,789	7.1	2.2	9.3

3/ Compendium of Citrus Statistics, FAO, Rome, 1967

It would appear from the above that whereas in countries like USA, Greece, Portugal, Argentina and Brazil over 80% of the total crop is consumed locally in fresh or processed form, domestic utilisation in Italy, Spain, Morocco, Israel, Cyprus and Lebanon is much less than 50% owing to the export-oriented nature of their industries. Annexures C-2 and 3 furnish data on production and utilisation of oranges, tangerines and clementines in the Mediterranean countries between 1961-62 and 1963-64, and projections for 1970 and 1975.

Varieties. The principal varieties of citrus grown in commercial quantities all over the world are numerous. Citrus covers a number of varieties each having special quality characteristics. Early Navel, Valencia Late and Shamouti, are well known among oranges, Marsh seedless, Pink and White seedless among grapefruits, and Eureka and Lisbon among lemons. Besides these internationally known varieties, each country grows considerable quantities of unspecified fruit peculiar to each region. For instance, citrus varieties of Spain, which ranks as the foremost exporter in the world, are indicated in the following table:

Citrus Varieties of Spain[4]

			(Thousand Tonnes) 1964-65
Oranges	:	Navels, Select Blancas,	1,650
		Common Blancas, Bloods, Varnas	130
		and Valencia Lates	100
Mandarins	:	Satsumas, Mandarins and Clementines	40
		Total	1,920

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[4] Field Survey

The following varieties were grown in Israel during 1964-65:

Citrus Varieties of Israel[5/]

	(Thousand Tonnes)
Shamouti	510
Valencia Late	130
Grapefruit	160
Lemons	30
Other Varieties	40
Total	870

Italian crop comprises blood varieties like Tarocco, Moro, Common Sanguinello and Sanguinello accounting for 54.7% of the total production, the remainder being made up by blond varieties including Common Blond, Oval and Bella Donna. Important citrus varieties grown in India on a commercial scale include sweet oranges (Malta or Sathgudi or Mosambi), santra or mandarin oranges, limes and lemons. All these citrus varieties belong to the botanical family 'Rutaceae'.

Mandarin or santra oranges of India include 'Loose Jacket' types such as Nagpur santra, Coorg santra, Khasi orange and Desi type. While satsuma variety of Mandarin oranges is not presently grown in commercial quantities in India, experiments made at Coorg in Mysore

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[5/] Citrus in Israel, Yehuda Chorin, Israel Periodicals, Tel Aviv, 1966 have met with some success. It is believed that Coorg (Mysore) and Abohar (Punjab) have soils and climates suitable for the growth of this important variety.

Seasons of Harvest. About 75% of the aggregate citrus production in the world in harvested during winter. Following are the main harvesting seasons in respect of major producers:

Seasons of Harvest[6]

Oranges

Country	Variety	Season of Harvest
Australia	Navels	April - May
Brazil	Navels	April - December
Cyprus	Ovals	December - April
	Valencia Lates	March - April
Israel	Shamoutis	December - April
	Valencia Lates	April - May
Italy	Palermo Bitters	January - February
Morocco	Navels	January - May
	Valencia Lates	March - June
	Hamlins	January
Spain	Blancas	January - February
	Bloods	February - March
	Navels	October - February
	Valencia Lates	April - May
USA	Californians	February - September

Grape Fruits

Brazil	
Israel	April - August
USA	November - May
Spain	June - August
South Africa	October - November
	April - October

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[6] Fruit Trade's Journal Year Book, London, 1966

Lemons

Cyprus	August - April
Greece	October - December
Israel	March - June
Italy	All Year
Morocco	November - December
USA	June--August

The above table indicates the seasonal variation of production in the principal growing countries of the world. Major varieties of oranges like Shamoutis, Navels, Valencia Lates, Blancas and Bloods are limited to December-May. Harvesting of grapefruits is limited to April-August and November-May periods and major part of lemon production is also concentrated in winter.

Detailed information in respect of seasons of harvest in India is given at Volume II, Annexure A-6. Two crops of oranges are harvested in India, one each in summer and winter facilitating the availability of fruits for approximately 8 months in a year. Limes bear fruit throughout the year due to successive flowering. Grapefruit comes to harvest during January-March in Punjab and Rajastha, and September-November in Maharashtra.

Yields. Citrus fruit in general is a heavy yielder in USA and Mediterranean region. Field yields in different countries range from 10 tonnes (Nagpur santra) per hectare in India to 15 tonnes (Tarocco) in Italy, 28 tonnes (Shamouti) in Israel and 30 tonnes (Washington Navel) in Spain. The average yield of Satsuma variety of mandarin oranges in Japan is reckoned at 20 tonnes per hectare which is reported to be the world record for commercial production of mandarins. Experiments for the commercial growth of mandarin oranges in Coorg have resulted in an average yield of 10 tonnes per hectare.

Production in Survey Countries

Among the countries surveyed, considerable quantities of citrus are grown in Spain, Italy, Greece, UAR and Lebanon. Production of citrus fruit in Survey countries at 5.7 million tonnes in 1966 accounted for 21% of the world output, Spain being the largest producer in Europe followed by Italy and Greece. In West Asia, considerable quantities of citrus are produced particularly in Lebanon and UAR. In idea of production in Survey countries can be had from the following table:

Production of Citrus Fruit in Survey Countries 7/

(Thousand Tonnes)

	1964	1966
Oranges		
Spain	1,777.0	2,366.0
Italy	1,119.0	1,369.5
Greece	392.3	407.4
UAR	384.0	404.0
Lebanon	145.0	164.0

7/ Basic Statistics Fresh Fruits and Vegetables Industries of Survey Countries, Volume III, Table A-1.

	1964	1966
Lemons		
Italy	565.4	608.1
Spain	109.9	94.8
Greece	90.0	101.6
UAR	88.0	85.0
Lebanon	64.0	69.0
Grapefruits		
Lebanon	16.0	17.0
Spain	4.2	6.9
Italy	N.A.	0.6

World Trade

Exports. Between 1954-55 and 1964-65, world exports of citrus fruits rose from 2.84 million tonnes to 4.35 million tonnes representing an increase of about 58% over the decade. The most impressive rise was, however, registered in oranges between 1962-63 and 1963-64 when exports rose from 2.79 million tonnes to 3.50 million tonnes reflecting a rise of 30%. Exports of different varieties over the decade under review are given below:

Exports of Citrus Fruits by Types[8]

(Thousand Tonnes)

	1954-55/ 1957-58 (Average)	1959-60	1962-63	1964-65
Oranges, Tangerines and Clementiones	2,339.0	2,892.1	2,799.4	3,501.0
Lemons and Limes	344.6	448.2	480.7	601.0
Grapefruits	162.2	196.3	204.6	257.0
Total	2,845.8	3,536.6	3,484.7	4,359.0

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[8] Monthly Bulletin of Agricultural Economics and Statistics, FAO, Rome, 1966

The trend in citrus fruit trading has been upward since 1954-55. Oranges, tangerines and clementines constitute the most important export item, having accounted for 80% of the total exports, lemons and grapefruit making up for the remainder. Besides growing availability of superior quality citrus fruit in the world, increased use of appropriate packaging material for safe transit coupled with concerted point of sale promotion carried out by countries like Israel, Morocco and USA, have contributed significantly to the remarkable rise in the world trade witnessed during the recent years.

Countrywise breakdown of world exports has been indicated below:

World Citrus Exports by Principal Exporting Countries [9]

(Thousand Tonnes)

Fruit and Country	1962-63	1963-64	1964-65
Oranges and Tangerines			
Spain	641.9	1,283.0	1,062.7
Israel	432.5	356.6	442.0
Morocco	352.4	463.5	417.2
Algeria	286.8	213.5	216.6
Italy	202.6	182.1	224.4
Lebanon	89.8	93.0	95.0
Greece	58.4	30.4	77.3
Cyprus	32.2	51.1	60.4

(Contd. next page)

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[9] Monthly Bulletin of Agricultural Economics and Statistics, FAO, Op. cit.

Fruit and Country	1962-63	1963-64	1964-65
Tunisia	28.8	31.5	41.2
Total (major Mediterranean exproters	2,125.4	2,704.7	2,636.8
South Africa[3]	235.5	281.1	270.0
United States[2]	165.9	194.7	216.8
Brazil[3]	144.2	97.0	165.0
Other Countries	128.4	163.7	212.4
World Total	2,799.4	3,441.2	3,501.0
Lemons and Limes			
Italy	228.1	292.3	337.2
United States[2]	100.7	100.0	98.6
Greece	38.3	27.2	41.5
Lebanon	32.7	30.0	38.0
Spain	16.2	45.5	34.6
Israel	13.5	11.2	10.8
Turkey	12.0	10.0	8.0
Other countries	39.2	38.6	32.3
World Total	480.7	554.8	601.0
Grapefruit			
United States[4]	70.4	79.6	83.0
Israel	64.3	77.8	89.6

Contd.

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2 - Crop year November-October. 3 - Data refer to Calendar year, second part of the split year. 4 - Crop year September - August.

Fruit and country	1962-63	1963-64	1964-65
South Africa	20.9	32.5	34.0
Cyprus	9.0	13.4	12.0
Trinidad and Tobago[3]	6.2	4.4	3.5
Other Countries	33.8	34.0	34.9
World Total	204.6	241.7	257.0
Citrus World Total	3,484.7	4,237.7	4,359.0

Spain is by far the largest exporter of oranges, tangerines and clementines to the world markets with a total share of approximately 32% of the total trade in 1966, followed by Israel 12%, Morocco 11% and USA 6%. She has almost doubled its exports between 1962 and 1965, exports reaching 1.10 million tonnes high in 1964-65 as against 658,000 tonnes in 1962-63. Israel, which ranks as the second largest exporter, has shown marginal improvement from 510,300 tonnes to 542,400 tonnes and Morocco has stepped up its exports from 352,400 tonnes to 417,200 tonnes during the same period. Other important suppliers of oranges include Italy, South Africa, Brazil, Algeria, Lebanon and Greece. Details of exports of oranges, tangerines and clementines are furnished at Annexure C-4.

Export trade in lemons and limes has also been rising rapidly between 1962-63 and 1964-65 from 480.700 tonnes to 601,000 tonnes. Italy dominates the lemon world market with 56% of the total trade in 1964-65. USA, Greece, Italy and Spain comprise the other important lemon trading countries. World imports of lemons and limes appear at annexure C-5.

Exports of grapefruits, emanating mainly from Israel, USA, South Africa and Cyprus rose from 204,600 tonnes in 1962-63 to 257,000 tonnes in 1964-65 reflecting an increase of about 21%. The international trade in grapefruits is dominated by USA and Israel, their share ranging between 60 to 65% over the 1962-65 period. Other suppliers of grapefruits include South Africa, Cyprus, Jamaica, Mainland China and Morocco. Annexure C-6 furnishes detailed information on the grapefruit exports of major countries during 1963-65 period.

Mediterranean countries, the leading most exporters of citrus fruits, contributed 3.42 million tonnes of supplies during 1965-66 as against their total production of 7.39 million tonnes during 1965-66 reflecting 47% disposal in the form of exports. Of the total Mediterranean exports, Spain alone accounted for 38%, followed by Israel 17% and Italy 15%. The table presented below indicates the production and exports of the Mediterranean region during 1965-66:

(Next page)

Production and Exports of Citrus Fruit in the Mediterranean Area [10]

(Thousand Tonnes)

	Production				Exports			
	Oranges & Tangerines	Lemons & Limes	Grapefruits	Total Citrus	Oranges & Tangerins	Lemons & Limes	Grapefruits	Total Citrus
Aggregate 11 countries	2,316	385	49	2,750	888.6	107.6	29.4	1,023.6
Italy	1,175	539	-	1,714	151.1	348.7	0.8	500.6
Spain	1,921	94	3	2,018	1,266.7	34.9	2.9	1,304.5
Israel	683	38	188	909	467.4	16.9	109.1	593.4
Total Mediterranean	6,095	1,056	240	7,391	2,771.8	508.1	142.2	3,422.1

FAO has projected that all Mediterranean countries will have more than 6 million tonnes of citrus fruit available for exports in 1975, in both fresh and processed form. The following table gives the anticipated level of export availability in the Mediterranean countries and import requirements in European countries by 1975.

(Table on next page)

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[10] Outlook for Horticultural Production in Mediterranean Region, FAO, Rome, 1966.

FAO has projected that all Mediterranean countries will have more than 6 million tonnes of citrus fruit available for exports in 1975, in both fresh and processed form. The following table gives the anticipated level of export availability in the Mediterranean countries and import requirements in European countries by 1975.

Projected Export Availability in Mediterranean Countries and Import Requirements in Europe 11/

(Thousand Tonnes)

Country/Region	Projected Export Availabilities	Country/Region	Projected Import Requirements
Total 11 countries	2,140@	EEC (importing countries)	3,360
Spain	1,556	United Kingdom	902
Israel	1,293	Rest of Western Europe	669
Italy	949	Eastern Europe + USSR	900
Total Mediterranean	5,938	Total Europe	5,838

@This figure is not entirely comparable since it excludes the equivalent of citrus products available for export.

11/ Outlook for Horticultural Production in Mediterranean Region, Op. cit.

It can be inferred from the above that the Mediterranean region will have adequate export surpluses for meeting the import requirements of West Europe by 1975 and if the outside supplies are taken into consideration, the availability will exceed consumption.

Imports. Having accounted for 3.37 million tonnes (89%) of the world citrus imports of 3.79 million tonnes (excluding East Europe and USSR) in 1964-65, West Europe constituted the most important citrus consuming region in the world. West Germany was the principal consumer account for about 30% of the total West European imports, followed by France 26% and UK 15%. While statistics relating to world imports appear at Annexure C-6, the European pattern of citrus imports in recent years is indicated below:

Imports of Citrus into West Europe[12]

(Thousand Tonnes)

	Total Citrus		Oranges and Tangerines	
	1962-63	1964-65	1962-63	1964-65
Western Europe	2,795.9	3,373.2	2,334.0	2,797.7
ECM Countries	1,837.4	2,267.4	1,558.0	1,910.8
West Germany	764.6	1,000.3	621.2	812.3
France	726.0	862.8	628.3	741.6
Netherlands	241.3	211.8	193.8	219.3
United Kingdom	472.5	510.1	381.3	403.2
Scandinavia	240.3	278.5	214.7	249.1
Sweden	101.0	119.6	92.7	109.3
Other West European Countries	245.7	319.2	180.0	243.6
Switzerland	95.1	120.5	72.3	95.4
Austria	83.8	108.6	62.1	82.9

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[12] Monthly Bulletin of Agricultural Economics and Statistics, FAO, Rome, September, 1966.

Oranges constituted 83% of the total fresh fruits imported into West Europe in 1964-65, followed by lemons and limes 11% and grapefruits 6%. Others included East European countries and USSR, Canada, New Zealand, Malaysia and Syria. FAO projected the import demand for citrus fruit to be of the order of 5.8 million tonnes by 1975 as against 3.37 million tonnes in 1964-65. It is also indicated that owing to the high price elasticities of demand for citrus fruit, competition is likely to become stiff resulting in growing pressure on prices.

Import Policy and Regulations

Different preferential trade systems are enforced in the international trade of citrus fruit with a view to affording favourable treatment to selected citrus producing countries in the matter of access to the consuming markets. Implication of some of the measures adopted by different countries are detailed below:

United Kingdom. UK extends preferential treatment to the citrus fruit imported from Commonwealth countries. Its imports during 1964-65 from the developing Commonwealth countries were valued at $ 3.9 million, mostly supplied by Cyprus. UK's imports of oranges from the Commonwealth are exempt from import duty whereas the supplies from non-Commonwealth sources are subject to a duty of Sh 3.6 ($ 0.15) per Cwt (equivalent to 5% ad valorem), when imported during April 1 and November 30, and 10% ad valorem during the remaining part of the year. The latter duty has since been halved under the Kennedy Round.

EEC Countries. The common external tariff levied on the imports of oranges in EEC countries from January 1, 1967 is calculated at 15% ad valorem during April 1 – October 15 and 20% for the rest of the year. Besides these import duties, EEC offers protection to the domestic producers of oranges (mainly Italy) by the system of 'reference prices'. 'Reference price' represents the level of price below which the member countries apply countervailing charges on imports emanating from third countries. This helps in establishing the price level of citrus fruit in EEC countries, thus rendering it difficult for the third country suppliers to quote prices lower than minimum prices from member countries. The prices are based on average cost of domestic production including the normal handling charges.

The reference prices fixed by the Commission of EEC for 1967-68 season were as follows:

Reference Prices Fixed by EEC for 1967-68[12]

Oranges

The 1967-68 prices (regulation No. 794/67/CEE of 31st October, 1967) were as follows:

	Reference prices $ per 100 kg		
Group	1966-67	1967-68	
I Moro and Tarocco	18.9	19.4	1st December-31st March
II Sanguinello	16.7	17.1	1st January-30th April
III Biondo commune	7.9	7.1	1st December-30th April

Minimum import prices ($ per 100 kg)

Group	1966-67	1967-68
I Moro and Tarocco	18.9	19.4
II Sanguinello	15.2	18.8
III Biondo commune	10.2	5.4

The regulation is operative from 1st December 1967 to 30th September 1968.

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[12] Commodities Division, Commonwealth Secretariat, London

Clementines, Mandarins etc.

The 1967-68 prices (regulation No. 795/67/CEE of 31st October 1967) were as follows:

Reference prices
$ per 100 kg

1966-67	1967-68
17.8 November 15.1 December-March	16.5 1st November-15th March

Minimum import prices
$ per 100 kg

1966-67	1967-68
14.2	13.2 November
11.3	12.4 December-15th March

EEC regulations on quality standards are very strict and the third country exports have to conform to standards whereas the member countries are allowed to sell inferior qualities of produce in production centres only. While the agreement on preferential treatments to be accorded to Maghreb countries (North African Countries) has not yet been finalised by EEC, their products are exempt from import duties in France where normal duty on citrus is 35% ad valorem.

Within the limits of a fixed quota, imports from Morocco are not subject to any customs duty in France. In case Morocco's exports exceed the prescribed quota they attract intra-EEC tariff duty and the implications of 'reference price system.

Though Maghreb countries and the non-EEC Mediterranean countries enjoy restricted advantages in some of the EEC countries, the EEC policy for according a general preferential treatment is yet to be finalised. The formation of CLAM (the Organisation of the Mediterranean Citrus Producers), demanding official recognition in EEC with a view to claiming preferential treatment in EEC countries, is likely to have significant impact on citrus marketing in West Europe. If the Commission on EEC agrees to extend these facilities to CLAM members, the entry of non-Mediterranean countries into the citrus market of ECM will be rendered extremely difficult.

Brand Publicity

Citrus marketing being fiercely competitive in West Europe, brand publicity has come to be an important strategy for sales promotion. It has been particularly so after the lead given by the Citrus Marketing Board of Israel. In tune with Israel, countries like Morocco, Spain, Tunisia and Cyprus reportedly spend large amounts of money on efforts aimed at sales promotion and publicity.

The publicity measures include describing brand names on the cartons and the tissue papers used for wrapping the fruit, display of hoardings, posters, advertisements in trade and consumer press, distribution of recipe books, and point-of-sale material. Citrus Marketing Board of Israel, through its central European office in London, employs scores of sales girls for visiting the retailers to help them in demonstrations and sales campaigns. Besides, prize competitions among retailers and consumers are organised by the Board. In-store display material for fruit publicity has multiplied recently in West European markets. Well displayed fruit in modern retailing units with the help of point-of-sale show cards constitute an important medium used by citrus marketing organisations.

In UK alone, Citrus Marketing Board of Israel spent 286,000 on press advertising during 1967 comprising $ 282,000 on publicity through television, and $ 4,000 on press advertising. Spanish exporters of oranges spent $ 29,000 during 1967 in UK, out of which $ 13,000 were devoted to television publicity. Similar publicity efforts are being made by other suppliers including Morocco, Brazil, Cyprus and South Africa.

Packing. Oranges and grapefruits are generally packed in cartons containing 30 kg fruit. Cartons used by countries like Israel, Spain and Morocco are of superior quality affording adequate protection to the fruit in transit. Each fruit is covered in a tissue paper and arranged in rows in the carton. The packing sizes used by major suppliers are indicated below:

Sizes of Cases and Cartons used[13/] for Citrus by Major Suppliers

Commodity	Country of Origin	Container	Net Weight Pounds
Oranges	Brazil	Case	60 - 72
	Cyprus	Case	65 - 68
	Israel	Case Bruce Box	85 - 90 40 - 45
	Morocco	Case	60 - 65
	Spain	Case	65 - 68
	USA	Carton	28 - 30

(Contd. next page)

[13/] Field Survey

Commodity	Country of Origin	Container	Net Weight Pounds
Grapefruits	Brazil	Case	58 - 62
	Cyprus	Case	66 - 70
	Israel	Case Carton	75 - 80 48
	Trinidad	Bruce Box	40
Lemons and Limes	Cyprus	Case Carton	64 - 68 28 - 32
	Greece	Box	26
	Israel	Half Case	30

Industry in Selected Countries

Citrus industries in selected countries are reviewed briefly below:

1) Israel

Israeli citrus fruit has established itself in the European markets notwithstanding the continuous and rapid increase of the crop in other supplier countries. It constitutes an important element in the agro-based economy of Israel and during the past decade has become one of the most profitable industries of the country.

Total area under citrus cultivation in Israel during 1962-64 period was reckoned at 40,145 hectares. In the recent years constant and rapid expansion of citrus planting has taken place in Israel, additional area under cultivation being 25,000 hectares during 1952-62. The Agricultural Planning Authority of Israel currently aims at a total harvested area of 45,000 hectares under the crop by 1970.

Production. Production in Israel has been rising over the years on account of the expansion in new plantings as well as the growing profitability of citrus cultivation in Israel; production went up from 565,000 tonnes in 1958-59 to 690,000 tonnes in 1962-63 and to 1.11 million tonnes in 1966-67. The 1964-65 total production of 870,000 tonnes comprised 510,000 tonnes of Shamoutis, 130,000 tonnes of Valencia, 160,000 tonnes of grapefruit, 30,000 tonnes of lemons and 40,000 tonnes of other citrus varieties. Having doubled its output during 1958-59 and 1965-66, production by 1970-71 is likely to be of order of 1.43 million tonnes. The projections made by the Israel Ministry of Agriculture are as follows:

Forecast of Citrus Crop from 1965-66 to 1970-71 14/

(Thousand Tonnes)

Season	Shamoutis	Valencias	Grapefruit	Washington Navels	Lemons	Various	Total
1965-66	597	145	188	15	41	31	1,017
1966-67	639	161	214	19	46	31	1,110
1967-68	680	179	242	20	49	32	1,202
1968-69	726	195	262	23	54	34	1,294
1969-70	769	212	277	27	56	36	1,377
1970-71	796	224	288	28	58	36	1,430

14/ Citrus in Israel, Op. cit.

Varieties. Shamoutis, Valencias, grapefruit and lemons are the important varieties of citrus grown in Israel. While Shamoutis constituted the principal variety till 1960s, a trend for expanding the cultivation of late orange varieties like Valencias, grapefruits and lemons has since been discernible. Whereas Shamoutis covered 70% of total area in the older orange groves, the future composition of groves is likely to be as follows:

Composition of Israeli Orange Groves by 1970 15/

Shamoutis	55%
Grapefruit	15%
Late Oranges (mainly Valencia)	15%
Lemons	5%
Navel Oranges, Clementines, etc.	10%

Diversification of varieties has been undertaken in Israel with a view to prolonging shipping season and for meeting the requirements of foreign consumers more adequately.

Yields. By the application of modern technological and scientific cultural practices, high field yields are obtained for citrus in Israel ranging from 16 tonnes per hectare of Navel oranges to 28 tonnes of Shamouti and 34 tonnes of grapefruits. Lemons bear approximately 17 tonnes of fruit per hectare.

15/ Citrus in Israel, Op. cit.

Cost of Cultivation. Cost of production has more than quadrupled between 1938-39 and 1964-65 as shown below:

Comparative Expenses of Cultivation in Israel (Shamouti full-bearing orange grove) 16/

($ standard case)

	1938-39	1964-65
Cultivation cost	0.24	0.96
Picking of the fruit	0.07	0.36
Packing	0.08	0.56
Packing materials	0.22	0.82
Transport and loading	0.10	0.30
Various fees and administration expenses	0.07	0.36
Total	0.78	3.36

The rise in the production cost, however, has to be viewed in the context of the growing FOB returns on the sale of a standard case of citrus fruit from $ 0.69 in 1938-39 to $ 4.25 in 1964-65. Increased cost of production has thus been more than off-set by rising export realization.

Exports. Out of the total production of 870,000 tonnes in 1964-65, 572,000 tonnes were directed to the overseas markets, reflecting a 66% disposal during the year. The trends in citrus exports vis-a-vis domestic consumption are indicated in the following table:

(Next page)

16/ Citrus in Israel, Op. cit.

Utilization of Citrus Fruit in Israel[17]

(Thousand Tonnes)

	Total Production	Local Consumption Quantity	%	For Processing Quantity	%	Fresh Exports Quantity	%
1958-59	565	73	13	108	19	384	68
1960-61	470	68	14	83	18	219	69
1962-63	690	78	11	119	17	493	72
1963-64	760	80	10	241	31	439	59
1964-65	870	75	8	223	25	572	67

Exports, it will be seen from the above table, constitute a major outlet for Israeli citrus crop, having averaged at 67% of the total produce during the last 5 years. Following table gives Israeli exports to West Europe, and per capita consumption of Israeli citrus in major European markets:

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[17] Citrus in Israel, Op. cit.

Exports of Israeli Citrus to West Europe during 1964-65 18/

(Quantity: Thousand Tonnes)

	Oranges and Tangerines		Grapefruit		Total Citrus (incldg Lemons)	
	Quantity	Kg.per capita	Quantity	Kg.per capita	Quantity	Kg.per capita
United Kingdom	130,119	2.26	27,832	0.48	159,933	2.78
West Germany	92,895	1.57	28,894	0.49	121,789	2.05
France	19,141	0.39	21,212	0.43	45,104	0.92
Netherlands	27,084	2.19	5,377	0.43	32,916	2.66
Sweden	35,514	4.58	2,483	0.32	38,658	3.73
Belgium and Luxemburg	21,601	2.20	7,456	0.76	29,821	2.02
Finland	22,501	4.95	1,939	0.42	25,142	5.42
Denmark	21,977	4.61	1,726	0.36	23,994	5.25
Switzerland	14,694	2.43	5,069	0.84	20,094	3.32
Austria	14,248	1.96	1,409	0.19	15,708	2.16
Norway	13,030	3.38	784	0.21	13,959	3.73
	412,804	1.86	104,181	0.47	528,116	2.37

Marketing. The significant impact made by Israeli citrus on West European markets is attributed to the efficient operation of the Citrus Marketing Board. The Board was established in 1942 mainly for rehabilitating the citrus industry which had suffered a severe setback during the Second World War. The principal task of the Board was to render all possible assistance to growers in cultivating the crop on modern and scientific lines. Following the successful revival of the industry, functions and activities of this Board while remaining basically the same, became more extensive and diversified in keeping with the rapidly

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18/ Citrus in Israel, Op. cit.

changing pattern of the citrus production in Israel. The Board has since been charged with the responsibility of pooling and marketing citrus production on a monopoly basis. The Board exercises complete control over the programmes of plantings and prepares a detailed plan for the disposal of the anticipated production at the beginning of each crop season. Basing its plan on the previous export performance of each overseas market and anticipated supplies of exportable products, the Board determines the market-wise allocations. It makes arrangements for bulk procurement of packing materials and undertakes negotiations as well as contracts with large importers and concludes agreement with the shipping companies.

With a view to promoting and controlling effectively the marketing of fruit abroad, the Board has set up a commercial organisation staffed by highly competent personnel in each of the major markets including UK, West Germany and France. In addition to arranging effective distribution of fruit, the agents keep close liaison with different interests in foreign markets.

The Board is also the final authority on the determination of policy and future programme for the development of the citrus industry in Israel. For instance, all the plantations are subject to the approval of the Government Planning Centre and the Citrus Board, and no new grove can be planted without obtaining licence from the Ministry of Agriculture and the Board. It also undertakes promotional compaigns abroad in a continuous manner. The functions of the Citrus Marketing Board are therefore comprehensive right from the stage of production planning to that of disposal of the crop both in the country and abroad.

2) Spain

Spain dominates the European citrus market, having accounted for over 35% of the total citrus exports emanating from the Mediterranean area during 1965-66. In production it ranks second, next to USA where most of the output is consumed locally both in fresh and processed forms. During 1965-66 Spain met approximately 50% of the total orange requirements of the West European markets.

Production. Spanish production of citrus fruit has been showing an upward trend since 1950s. It has risen from 1.88 million tonnes in 1964 to 2.46 million tonnes in 1966 reflecting a rise of approximately 25% over the period. Following table indicates the trends in the production of citrus fruit in Spain over the last three years by varieties:

Production of Citrus in Spain by Varieties[19]

(Thousand Tonnes)

	1964	1965	1966
Fresh Fruits			
Navels	525.2	653.5	972.7
Sanguinas	506.2	471.7	534.0
Verna	200.0	198.0	207.0
Blanca-Selected	183.5	169.4	196.0
Blanca-Commons	133.5	153.7	161.3
Lemons-Verna	94.5	82.9	82.2
Valencia Late	66.9	67.6	66.5
Mandarins	57.1	61.1	62.1

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[19] Spanish Fruit and Vegetable Syndicate, Madrid

	1964	1965	1966
Clementines	38.5	51.8	67.5
Satsumas	38.0	44.2	79.1
Bitter Oranges	21.0	22.0	20.3
Lemons-Promojiori etc.	15.4	9.6	12.6
Grapefruits	4.2	6.5	6.9
Total	1,884.0	1,992.2	2,467.9

Varieties. Mid-season varieties comprising Navelinas, Cammunes, Sanguines, Sanguines Ovals and Ameres dominate the Spanish orange production having accounted for 45% of the total crop during 1964-65. Early varieties mainly Navels, Cadeneras and Salustianas represented 40% of the total crop in 1964-65 and Verna and Valencia Lates making up for the remaing 15%. Of the total orange area of 130,000 hectares in 1964-65 only 64,000 hectares were in full bearing, 25,000 hectares in partial bearing, and the remaining area contains trees which have yet to start bearing. Though oranges constituted the most important fruit grown in Spain till 1960s, the recent trend is towards the larger plantations of Satsumas, Clementines and Navel oranges.

Seasons of Harvest. Spanish oranges are grown principally in winter, harvesting being done during October and May. However, the major proportion of the citrus trees bear fruit during December and March as would be evident from the following table:

(Next page)

Season of Harvest in Spain[20]

Variety	Season of Harvest
Blancas	January-February
Cadeneras	January-March
Bloods	February-March
Valencia Lates	April-May
Vernas	April-May
Navels	October-February
Seville Bitters	December-February

The harvesting of lemons and grapefruits, however, occurs only for two months, i.e., during October and November.

Yields. The large scale expansion that has taken place in the production of oranges in Spain is largely attributable to the increase in field yields obtained in Spain during the recent past owing to the growing usage of modern techniques of cultivation. While yield per orange tree was only 30 kg in 1955-56, it reached 42 kg high in 1964-65. Whereas the yield of lemons rose from 21 kg to 35 kg that of grapefruits increased from 33 kg per tree to 40 kg over the period. The yield in respect of mandarins, has however, remained stagnant around 22 kg.

Exports. Spain constitutes the largest trader in citrus fruit having exported 1.06 million tonnes of the total world exports of 4.35 million in 1964-65. Oranges are the major export item of Spain, followed by lemons and limes which form but an inconsequential proportion of the total citrus exports. Despite the leading position held by her, exports grew unimpressively from 1.26 million in 1963-64 to 1.30 million in 1965-66. According to Spanish Fruits and Vegetables Syndicate, Madrid, exports during 1966-67 were marginally lower at 1.28 million tonnes than that of the previous year.

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[20] Spanish Fruit and Vegetable Syndicate, Op. cit.

While production of citrus is growing, a decline in foreign demand has been noticed in the recent past in view of the EEC restrictive regulations imposed on the import of citrus fruit from third countries and the competition offered by Israel and Morocco in the markets held traditionally by Spain. Cost of production in Spain is rising, particularly in respect of picking, packing and freight rates. Besides, sales promotional expenditure has been mounting from year to year.

Spanish exports are mainly directed to West Germany, France, Netherlands and United Kingdom, together accounting for 75% of the total exports of oranges, 72% of tangerines 73% of lemons and 88% of grapefruits in 1966-67.

Utilisation. As mentioned earlier, exports constitute the most important outlet for the Spanish output of citrus fruit, domestic consumption being relatively small. Data on the utilisation of citrus during 1966-67, is presented below:

Utilisation of Citrus Fruit During 1966-67[21]

(Thousand Tonnes)

Kinds	Domestic	Exports	Total	Processed	Total Utilisation
Oranges	872,405	1,085,145	1,957,550	200,000	2,157,550
Tangarines	53,140	154,010	207,150	1,500	208,650

(Contd. next page)

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[21] Spanish Fruits and Vegetables Syndicate, Madrid

Kinds	Domestic	Exports	Total	Processed	Total Utilisation
Lemons	45,467	42,783	88,250	6,500	94,750
Grapefruit	1,579	3,321	4,900	2,000	6,900
	972,591	1,285,259	2,257,850	210,000	2,467,850

Out of the total citrus production of 2.46 million tonnes in 1966-67, exports represented approximately 50%,the remaining going for domestic consumption in fresh and processed forms. Based on the present utilisation trends in the Spanish citrus industry, OECD has made the following projections for 1970-71:

Projection of Utilisation of Citrus Fruit by 1970-71 22/

(Thousand Tonnes)

Commodity	Total Production	Domestic Consumption	Exports (fresh)	Processing
Oranges	2,150.0	550.0	1,400.0	200.0
Mandarins	250.0	91.0	150.0	9.0
Lemons	145.0	80.0	60.0	5.0
Grapefruits	8.0	3.0	4.0	1.0

3) Italy

Among fruit crops of Italy, citrus has a commanding position, having accounted for 25% of the total production of fresh fruits in 1966. Trade in citrus is also growing at a fast rate and with EEC's preferential treatment being accorded to Italian produce, it is expected to rise manifold in the future years.

22/ Production of Fruits and Vegetables in OECD Member Countries, Report on Italy, OECD, Paris, 1968.

Production. Among the citrus fruit grown in Italy, oranges are the most important accounting for over 50% of the total production during 1966. In respect of lemons, where Italy holds a dominating position in the world, production was of the order of 193,000 tonnes in 1966 as against 163,800 tonnes during 1964. Following are the production statistics for different kinds of Italian citrus fruit during 1964-66:

Production of Citrus Fruit in Italy
during 1964-66 23/

(Thousand Tonnes)

	1964	1965	1966
Oranges	1,019.6	997.5	1,176.5
Lemons	559.5	559.6	603.9
Mandarins	163.8	177.2	193.9
Bergamotti	54.0	38.3	50.8
Citrons	5.9	3.6	4.2
Grapefruit	0.6	0.6	0.6
Total (including others)	1,803.4	1,776.9	2,029.0

It would be seen from the above that Italian citrus fruit mainly comprises oranges, lemons, mandarins and bergamotti, others being of no consequence. The Survey has revealed that field yields obtained in Italy for citrus fruit have been upward, owing to increasing use of modern

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23/ Ministry of Agriculture, Rome

techniques and high yielding fertilizers. Average yield per hectare ranges between 15 tonnes of mandarins to 16 tonnes of oranges and 18 tonnes of lemons.

Varieties. In the initial years of the Italian citrus industry, production was mainly oriented towards domestic market resulting in the cultivation of larger quantities of Tarocco and Moro varieties of oranges. The recent years, however, have witnessed a reversal of the trend whereby more significance is being attached to the cultivation of Blond varieties (mainly Valencia Late, Washington Navel and Italy Oval) in greater demand in the European markets. However, the present position countinues to favour Blood varieties as compared to Blond varieties, as would be evident from the table given below:

Breakdown of Italian Orange Production by Varieties 24/

(percentage of Production)

Blood Oranges	%	Blond Orange	%
Tarocco	16.9	Common Blond	32.8
Moro	13.9	Oval	7.4
Common Sanguinello	12.8	Bella Donna	2.0
Sanguinello	11.1		
Total	54.7		42.2

24/ Production of Fruit and Vegetables in OECD Member Countries, Report on Italy, OECD, Paris, 1960.

Exports. Considerable quantities of Italian citrus fruit are exported, bulk of it going to ECM countries on account of the preferential treatment. Total exports of citrus fruit comprising oranges, lemons and mandarins which were of the order of 561,100 tonnes in 1965 declined to 483,100 tonnes during 1966; the decline was only with respect to oranges, exports of which fell from 200,000 tonnes to 123,700 tonnes over the period. Exports of mandarins, on the other hand, rose by 8% over the period and the statistics for January-September 1967 indicate that the rise was maintained in mandarin exports. Trade discussions revealed that the fall in the exports of oranges is to a large extent attributable to the inferior quality of citrus grown presently in Italy. Blood oranges, whose importance is on the decline in Europe, continue to dominate the Italian horticulture. It is also understood that the size and colour of Italian oranges are not acceptable among European consumers, the skin of the oranges, for example, being too pigmented. Likewise, Sicilian oranges suffer from lack of standardised packing and grading. These are some of the problems which have come in the way of export promotion of Italian oranges.

A large proportion of the Italian exports of oranges is directed to neighbouring European countries, important among them being West Germany, Switzerland and Austria. Italian lemons, on the other hand, whose export performance has been improving over the years, are exported mainly to West Germany, France, UK, Austria and Switzerland. Besides, East European countries have come to be a significant outlet for Italian lemons, sizeable supplies having been shipped to these countries in the recent past.

Projections. Domestic consumption of citrus fruit in Italy has been considerable, having averaged at 66% of the total production over 1964-66. The following table would indicate the position of citrus exports vis-a-vis domestic consumption during 1964-66:

Utilisation of Citrus Fruit in Italy during 1964-66 25/

(Thousand Tonnes)

	Domestic Consumption	%	Exports	%
1964	979.0	65.6	514.0	34.4
1965	1,046.0	65.0	562.0	35.0
1966	1,132.0	70.1	485.3	29.9

Prospects as envisaged by OECD study for 1970 indicate that out of the projected production of 1.20 million tonnes, 900,000 tonnes would be consumed locally, 70,000 tonnes processed and 230,000 tonnes exported. The domestic pull being very strong in Italy, the pattern of citrus utilisation is not expected to undergo any significant change by 1970.

Exports of lemons on the other hand, are envisaged to increase to 303,000 tonnes against our estimated production of 600,000 tonnes by 1970.

Marketing. There is no centralised marketing organisation for citrus exports in Italy resulting in the operation of a large number of small sized exporters. This has been

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25/ Production of Fruits and Vegetables in OECD Member Countries, Op. cit.

creating problems in respect of standardization of quality and packing as well as systematic marketing operations abroad. It was understood that in the absence of any selectivity among exporters, inferior products are being exported thereby damaging the reputation of Italian products abroad. Efforts are now being made to encourage the establishment of Consortia of exporters in the citrus trade.

4) Greece

Among various fruit crops grown in Greece, citrus is the most important, where rapid development has taken place during the last two decades. Total area under citrus cultivation is reckoned at 40,000 hectares in 1967 as against 10,000 hectares in 1940. There are approximately 15 million trees out of which little over 15% are dispersed in mixed plantings and orchards, commercial groves thus having accounted for 85%. According to the Ministry of Agriculture, Greece, the distribution of citrus trees by age was as follows during 1965:

Distribution of Citrus Trees by Age in Greece during 1965 26/

(Percentage)

	Less than 5 years	From 5 to 10 years	More than 10 years	Total
Oranges	24	19	57	100
Mandarins and clementines	8	10	82	100
Lemons	19	27	54	100
Total	21	20	59	100

26/ Ministry of Agriculture, Greece.

It can be inferred from the above that 59% of the total citrus trees are over 10 years of age, the remaining 41% being less than 10 years of age. This would clearly indicate the future expansion possibilities in Greece, where 20% of the trees will start bearing fruit in the immediate future.

Production. According to FAO, production of citrus fruit in Greece rose from 257,900 tonnes in 1957-60 to 365,700 tonnes in 1963-66, domestic consumption having accounted for 75% of the crop in 1966 as against 82% in 1957. Oranges accounting for 70% of the total output in recent years, constitute the most important fruit. While the share of mandarins and clementines declined from about 14% to 6%, over the last 15 years, lemons have remained steady at approximately 25% of the total. The table below gives information on the production and utilisation of citrus fruit during 1957-60 and 1963-65:

Current Production and Utilisation of Citrus in Greece 27/

(Thousand Tonnes)

	Production	Domestic Fresh	Consumption Processed	Exports	Production	Domestic Fresh	Consumption Processed	Exports
Oranges	173.6	140.5	15.0	18.1	246.3	146.9	60.0	57.4
Mandarins and Clementines	24.9	19.4	-	5.5	21.4	17.0	-	4.4
Lemons	59.4	33.4	3.5	22.5	90.0	39.8	17.0	33.2
Total	257.9	193.4	18.5	46.1	375.7	203.7	77.0	95.0

27/ Outlook for Production and Trade Selected Horticultural Products in Mediterranean Countries, Report on Greece, FAO, Rome, 1967

It is apparent that domestic market constitutes the main outlet for Greek citrus crop in respect of fresh produce, though the share of exports has gone up rapidly. It is further known that as against the total orange production of 378,000 tonnes during 1966, exports of oranges amounted to 84,569 tonnes, mainly to West Germany, Austria, Yugoslavia and USSR.

According to FAO, the production of citrus fruit in Greece is likely to rise by about 59% in 1970 and 112% by 1975 over the level of 1963-66, owing to the rising field yields, maturing of the previously grown plantations and subsidies offered by the Government. Based on the above FAO projections, production for 1970 and 1975 has been worked out as follow:

Anticipated Production of Citrus by 1970 and 1975 28/

(Thousand Tonnes)

	1963-66	1970 (% increase)	1975 (% increase)
Oranges	264.3	420.0 (+59)	560.0 (+112)
Mandarins and Clementines	21.4	25.0 (+17)	26.0 (+21)
Lemons	90.0	130.0 (+45)	150.0 (+72)
Total	375.7	575.0 (+53)	736.0 (+97)

The projections for production and utilisation of fruit are shown in the following table:

Projected Production and Utilisation of Citrus in Greece by 1970 and 1975 29/

(Thousand Tonnes)

	1970				1975			
	Production	Domestic Fresh Consumption	Processed	Export Availability	Production	Domestic Fresh Consumption	Processed	Export Availability
Oranges	264.3	146.9	60.0	57.4	560.0	181.9	180.0	198.1
Lemons	21.4	17.0	-	4.4	26.0	21.0	-	5.0

(Contd.)

28/ & 29/ Outlook for Production and Trade of Selected Horticultural Products, in Mediterranean Countries, Op. cit.

	Production	Domestic Fresh Consumption	Processed	Export Availability	Production	Domestic Fresh Consumption	Processed	Export Availability
Mandarins & Clementines	90.0	39.8	17.0	33.2	150.0	45.0	45.0	55.6
Total	375.7	203.7	77.0	95.0	736.0	253.3	225.3	258.7

It has been projected that orange exports will double by 1975 reaching the level of 258,700 tonnes, whereas mandarins, clementines and lemons will register a relatively low rate of growth.

Varieties. While major proportion of the citrus trees were given over to Navel varieties of oranges till 1950s, the present trend is towards the cultivation of varieties like Moro, Tarocco and Valencia Lates which command a larger consumer following in the overseas markets. It is estimated that about 80% of the trees presently represent Washington Navel variety, remaining 20% belonging to other varieties. The Survey has also revealed that clementines are preferred to mandarins by the Greek growers.

Seasons of Harvest. The harvesting seasons as well as season peaks for different citrus fruits are indicated in the following table:

Harvesting Seasons and Shares of Harvesting in Peak Seasons in Greece 30/

	Beginning	End of Season	Season Peak	% of Crop harvested in Season Peak
Oranges	Nov. 16-30	April 1-30	Dec. 1-Feb.28	60%
Mandarins and Clementines	Nov. 1-20	Feb. 1-20	Dec. 1-Dec.31	52%
Lemons	Oct. 16-31	May 1-13	Nov. 1-Dec.31	59%

Yields. Citrus fruit in Greece is not a very high yielder, average yield per hectare of oranges being around 20 tonnes and lemons 15 tonnes. According to the Ministry of Agriculture, Greece. Citrus field yields would rise by about 15% in 1975 owing to the growing modernisation in horticulture.

30/ Outlook for Production and Trade of Selected Horticultural Products in Mediterranean Countries, Op. cit.

5) Lebanon

Citrus has a commanding position in the horticultural production of Lebanon, having accounted for $ 17.30 million worth of production out of the total fruit production of $ 46.10 million in 1965. Total area under cultivation was reckoned at 12,200 hectares in 1965 as against 7,150 hectares during 1955-56[31].

Production. Production in Lebanon has been steadily rising during the past decade, having doubled from 165,000 tonnes in 1960-61 to 231,600 tonnes in 1965-66. Following table would reflect the trends in production during 1960-61 and 1965-66:

Production of Citrus in Lebanon during 1960-61 and 1965-66 [32]

(Thousand Tonnes)

Year	Oranges and tangerines	Lemons	Grapefruits & limes	Total
1960-61	100.0	40.0	15.0	165.0
1961-62	127.0	57.0	16.0	200.0
1962-63	133.0	55.0	12.0	200.0
1963-64 (Est)	147.0	62.0	16.0	225.0
1964-65 (Est)	145.0	64.0	16.0	225.0
1965-66 (Est)	151.6	63.0	17.0	231.6

It would be apparent from the above that oranges and tangerines are the most important citrus fruit in Lebanon, accounting for approximately 64% of the total citrus production in 1965-66, followed by lemons and grapefruits & limes.

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[31] & [32] Outlook for Production and Trade of Selected Horticultural Products in Mediterranean Countries, Report on Lebanon, FAO, Rome, 1967

Varieties. Washington Navels, Shamoutis, Khettmalis, Birsi and Valencia Lates are the important orange varieties grown in the country. In the South of Lebanon where majority of citrus groves are concentrated, composition of citrus groves has been estimated as follows:

Composition of Citrus Groves in South of Lebanon

Oranges	65%
Lemons	25%
Tangerines	10%

The Survey revealed that Shamouti being the most important orange variety grown in Southern Lebanon, occupies over 60% of the total orange groves. While the area under cultivation of lemons and limes was not sizeable till 1961-62, a tendency has recently been noticed in the South of Lebanon to increase the share of lemon trees in new plantings to about 60%, the remaining 40% being given over to oranges. This is mainly on account of the rising demand for Lebanese lemons both in the country and abroad.

Seasons of Harvest. Citrus harvesting is done from the end of October till early July, thus giving it approximately 30 days more than the other Meditarranean countries like Greece and Spain. Lemons, however, are available throughout the year.

Exports. A major proportion of the fruit is utilised in fresh form for exports and domestic consumption. With the establishment of new processing units in Lebanon, the industrial utilisation of citrus fruit is expected to rise to 15% by 1975 from the present level of 2%.

In tune with the expansion taking place in the production of citrus, exports have risen significantly over the past 8 years, having accounted for 17%, of the total agricultural exports of Lebanon. Exports of citrus fruit comprising oranges, lemons and grapefruits rose from 81,431 tonnes in 1960-61 to 115,808 tonnes in 1965-66. The domestic market being small and consumption being not considerable, exports constitute the main outlet for the increasing citrus production in the country, as would be seen from the following table:

Exports and Domestic Consumption of Citrus Fruit in Lebanon [33]

(Tonnes)

Year	Oranges & Tangerines Exports	Domestic disappearance	Lemons		Total Citrus (including grapefruits)	
			Exports	Domestic disappearance	Exports	Domestic disappearance
1960-61(1)	63,378	36,622	17,736	22,264	81,431	73,569
1961-62(1)	49,851	77,149	18,316	38,684	68,656	68,511
1962-63	78,265	54,735	27,785	27,215	107,127	92,873
1963-64	90,153	56,847	25,605	36,395	116,643	108,357
1964-65	83,561	61,439	34,363	29,637	119,650	105,350
1965-66	76,991	74,609	36,887	26,113	115,808	115,792

(1) Data relate to calendar year (first part of the split year)

Over 95% of the Lebanese citrus exports are directed to neighbouring West Asian countries, remaining 5% going to East European countries. Lemons particularly are being increasingly favoured in East European countries, exports being almost evenly divided between East Europe and West Asia. Though present exports to West Europe are negligible, efforts are being intensified for stepping up exports to this growing market.

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[33] Outlook for Production and Trade of Selected Horticultural Products, Op. cit.

Projection. In view of the heavy outlay on irrigation projects in Lebanon, considerable expansion in citrus production is anticipated. The total area under citrus cultivation is projected to rise to about 15,000 hectares in 1970 and 20,000 hectares by 1975. Based on the above and the expected rise in field yields, citrus production has been projected to rise to 300,000 tonnes by 1970 and 380,000 tonnes by 1975, as shown in the table given below:

Estimates of Citrus Production in Lebanon by 1970 and 1975 [34]

(Tonnes)

Species	1970		1975	
	Quantity	Increase (%)	Quantity	Increase (%)
Oranges and Tangerines	190,000	32	230,000	60
Lemons	90,000	48	125,000	105
Other Citrus	20,000	33	25,000	67
Total Citrus	300,000	36	380,000	73

It is further indicated that out of the total production of 300,000 tonnes of citrus in 1970, 168,000 tonnes (112,000 tonnes of oranges and tangerines, 53,000 tonnes of lemons and 3,000 tonnes of grapefruits), would be directed to export markets. By 1975 exports are envisaged to be of the order of 227,000 tonnes.

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[34] Outlook for Production and Trade of Selected Horticultural Products, Op. cit.

Export Marketing. Exports of fresh fruits and vegetables though undertaken entirely by private trading organisations, are encouraged by the Government in the form of insitutional assistance. The Fruit Office established in 1959 by a decree of the Government takes necessary steps to ensure that only quality products are exported.

6) Morocco

Among the North African countries, Morocco holds a special position in respect of production and exports of citrus, a top foreign exchange earner in the recent past. Total area under cultivation during 1965 was reckoned at 57,000 hectares, Rharb Valley being the most important area where a major proportion of the citrus groves are concentrated. Oranges, clementines, lemons and grapefruits constitute the major commodities currently grown in Morocco. The area under cultivation of different fruits is indicated in the following table:

Citrus Area by Citrus Fruit in Morocco in 1965[35]

	(Hectares)
Oranges	48,300
Mandarins and Wilkinds	700
Clementines	5,400
Lemons	1,000
Grapefruits	1,600
Total	57,000

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[35] Outlook for Production and Trade of Selected Horticultural Products in Mediterranean countries, Report on Morocco, FAO, Rome, 1967

Production. Production of citrus fruit in Morocco has been growing rapidly over the years particularly between 1950 and 1965, when large-scale expansion in area as well as the number of modern groves took place in the country, total production having risen from 189,900 tonnes in 1949-50 to 550,100 tonnes in 1962-63/1964-65. Moroccan production of citrus by types is indicated in the table given below:

Production of Citrus in Morocco[36]

(Thousand Tonnes)

	Oranges	Clementines and Mandarins	Grapefruits	Lemons	Total Citrus
1949-50/1952-53	161.6	19.7	3.7	4.9	189.9
1962-63/1964-65	469.6	60.0	12.9	7.9	550.1
% increase	+191	+204	+240	+61	+190

It is apparent that the average annual increase is the production of citrus has been in the neighbourhood of 30,000 tonnes during the last 15 years, and this rising trend is expected to continue in view of a relatively large number of plantations being under 5 years of age. Production is anticipated to multiply in the coming years as would be evident from the table given below indicating the FAO projections:

(Next Page)

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[36] Outlook for Production and Trade of Selected Horticultural Products in Meditarranean countries, Report on Morocco, FAO, Rome, 1967

Citrus Production in Morocco - Projections for 1975-76 37/

Production: Thousand Tonnes
Area : Thousand Hectares

	1962-63/1964-65		1970-71		1975-76
	Production	Area	Production	Area	Production
Oranges	469.6	47.6	850	54.0	1,000
Clementines and mandarins	60.0	5.5	80	6.1	90
Grapefruits	12.6	1.6	25	2.1	33
Lemons	7.9	55.7	970	63.6	1,138

Varieties. While Morocco produces a number of varieties of oranges, late varieties comprising Valencia Lates and Vernas, and early varieties principally Navels, Cadeneras and Hamelins are important, having accounted for 43% each of the area under citrus cultivation in 1965. Mid-season varieties which are not very important in Morocco include small quantities of both Blond and Blood oranges.

Yields. The average yield per hectare in Morocco is reckoned at 15 tonnes, though certain modernised groves in Rharb Valley give a much higher yield of 30 tonnes per hectare. The average yield is likely to increase to about 20 tonnes per hectare in coming years owing to the growing use of modern cultivation techniques in the country.

Exports. About 75% of total orange production and 50% of grapefruits and lemons constitute the major citrus exports of Morocco. Exports which averaged at 382,900 tonnes in

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37/ Outlook of Production and Trade of Selected Horticultural Products in Mediterranean Countries, Op. cit.

1960-64, are projected to rise to 719,500 tonnes and 845,500 tonnes by 1970 and 1975 respectively. Domestic consumption, on the other hand, declined over the last 15 years, per capita consumption having fallen from 9.50 kg in 1958-59 to 8 kg in 1963-64. Projections of production and utilisation of citrus fruit are indicated in the following table:

Citrus Production and Utilization - Actual and Projected 38/

(Thousand Tonnes)

	1960/61 - 1963/64			1975			
	Production	Domestic Demand	Exports	Production	Domestic Demand	Exports	
						Fresh	Processed
Oranges	448.5	113.0	335.5	1,000.0	231.0	750.0	769.0
Clementines & Tangerines	46.5	9.3	37.2	90.0	14.7	72.0	75.0
Grapefruits	12.3	6.0	6.7	33.0	19.1	16.0	13.9
Lemons	7.1	3.5	3.6	15.0	5.9	7.5	9.1
Total Citrus	514.4	131.4	383.0	1,138.0	270.7	845.5	867.3

Marketing. Special steps including the establishment of producers' cooperatives and associations, have been initiated in Morocco for steamlining the export marketing of horticultural produce, particularly citrus. The Government, by its decree of July 1965 established 'Office de Commercialisation of d'Exportation' (OEC), which holds complete control over the export operations of citrus,

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38/ Outlook for Production and Trade of Selected Horticultural Products in Mediterranean Countries, Op. cit.

fresh vegetables and canned products. This agency though not having any control over production, is in a position to influence the production activities by way of enforcing regulations and standards in respect of packaging and handling of the produce. The OEC sells its products mainly on the basis of consignments through 'importers panels' in important overseas markets. The growers are paid in accordance with the price pre-determined by OCE on the basis of quality standards and the period of consignment. It also undertakes promotional campaigns in overseas markets aimed at popularization of Moroccan citrus among European consumers, through its overseas offices. The operation of OCE has helped in stabilising prices and creating a better image for the country's products particularly in UK and France.

7) India

India is one of the major citrus producing countries of the world, with a total area of one million hectares and an average annual production of 1.2 million tonnes. Owing to the absence of the cultivation of well known varieties like Shamoutis and Valencia Lates, most of the domestic production is consumed locally in fresh form, exports and processing having accounted for an insignificant proportion of the total crop.

Area Under Cultivation. The break-up of the present area under citrus cultivation by varieties is indicated in the following table:

(Next Page)

Estimated Area Under Different Citrus Fruits in India 39/

Variety	Area in Hectares	Percentage to total area
Sweet Oranges	24,407	23.2
Mandarin	43,480	41.2
Sour and bitter oranges	1,085	1.0
Limes	28,373	26.9
Lemons	5,663	5.4
Other citrus fruits	2,388	2.3
Total	105,396	100.0

Citrus is principally grown in Andhra Pradesh, Maharashtra, Mysore, Assam, Punjab and Rajasthan, together accounting for 75% of the total citrus area.

Production. With 1.21 million tonnes, citrus constitutes one of the most important crops grown in India with 10% share of the total fruit production in the country during 1961-62 as shown below:

Production of Citrus Fruits in India 40/

(Thousand Tonnes)

Item	Quantity
Mandarin oranges	473.8
Limes	350.7
Sweet oranges	278.2
Lemons	64.4
Sour and bitter oranges	12.4
Other citrus fruits (mainly grapefruits)	32.4
Total	1,211.9

39/ & 40/ Directorate of Marketing and Inspection, Nagpur

Having accounted for 39% of the total citrus crop, mandarins constitute the most important variety of Indian citrus, followed by limes 28%, and sweet oranges 22%. Production of lemons and grapefruits is, however, relatively small.

Andhra Pradesh holds a commanding position in citrus with a share of 25% of the total production in 1961-62 and followed by Maharashtra 18%, Mysore 15.0%, Punjab 7% and Rajasthan 4%.

Varieties. Numerous varieties of citrus fruits, having varying commercial importance, are grown in the country. Among the sweet oranges, Malta Blood Red and Mosambi/Sathgudi are important. Nagpur santra, Khasi oranges and Coorg oranges are the major varieties in mandarins. In respect of lemons, the important varieties include Italian, Eureka, Lisbon, Villa France and Geneva. It is, however, in the field of limes that India commands an important position, well-known varieties being Kagzi Nimboo (C. Aurantifolia, Swingle) and Pati Nimboo. Grapefruits are cultivated only to a limited extent in India, and the varieties grown include Marsh Seedless, Triumph, Duncan and Foster. Detailed characteristics of the citrus varieties grown in India and their regional importance are given at Volume II, Annexure A-6 of the Report.

Utilisation. The total quantity of citrus fruit annually consumed in India is estimated at 1.1 million tonnes, of which only 1,936 tonnes are processed, the balance being consumed in fresh form locally.

The present level of exports of citrus fruits is very insignificant, only a few trial consignments having been despatched to Switzerland by the Directorate of Marketing and Inspection, Nagpur in 1963. While the general reaction to the quality of the fruit was reportedly favourable, it was suggested by the importers that with a view to competing with Spanish and Italian mandarins, the colour of the skin of Indian oranges should be more yellow. Details of the trial consignments appear at Volume II, Annexure A-22 of the Report.

Prospects for India

Available information on trends in international trade of citrus, as reviewed earlier, indicates good potential for fresh mandarin oranges in the West European countries. Presently, the West European markets for fresh citrus is dominated by Spain, Israel, Italy, Greece, Cyprus, Morocco, West Asia being catered mainly by Lebanon.

The trial consignments of oranges sent in 1963 and the findings of the Trade Delegation which visited Italy, Switzerland, France, Belgium and United Kingdom in 1966 indicate that India can export sizeable quantities of mandarin oranges during December-February, given adequate export-orientation to the industry. In fact, this is an area where India enjoys a distinct advantage in the matter of production as well as exports among all fruit crops. Very little, however, has so far been done to gear up the Indian citrus industry to the requirements of export markets.

Against the background of adequate potential that is available for Indian citrus fruit in the European, West Asian and South-East Asian countries, it has been projected that India should be in a position to export 5,000 tonnes of oranges and 5,000 tonnes of limes by 1975-76 provided necessary steps for making it a viable export industry are initiated. The prospects existing for different varieties of citrus fruits of Indian origin are discussed below.

(a) Oranges. The varieties of oranges grown in India include 'Malta Blood Red', 'Mosambi' and 'Sathgudi'. In the international trade of oranges, the most predominant variety is Washington Navel which is not grown in India at present. It has been, however, reported that Washington Navel and Shamouti oranges could be cultivated in India. The development of production of these varieties is a pre-requisite for entering the export markets for oranges.

In the short-term, India can tap the potential available in the neighbouring countries, such as, Singapore, Hong Kong and Malaysia where total imports of oranges amounted to 89,400 tonnes ($ 18 million) in 1965. Importers contacted in Singapore during the Survey evinced interest in Indian oranges. Presently, Australia, Israel, Taiwan and China (Mainland) are the major suppliers to this market. The average c.i.f. prices offered in these countries ranged from $ 200 to $ 230 per tonne (for Valencia Late) in February, 1968. A few trial consignments of 'Mosambi' and 'Malta' oranges from India could be sent to these markets with a view to ascertaining their acceptability.

(b) Limes. India has a large production-base for limes. Vigorous efforts should be made to export them to European and West Asian markets. Importers contacted during the Survey in West Germany and Switzerland evinced considerable interest for introducing Indian limes in their markets. They opined that consumer preference for limes could be developed in view of the fact that they are more juicy, smooth and thin-skinned compared to lemons. Trial consignment of limes may be sent for ascertaining their (Indian limes) marketability. These trial consignments should be packed in polythene lined bags containing 5 and/or 12 fruits. Twelve such bags should be packed in a card-board carton.

(c) Grapefruits. Grapefruit output in India is, at present, hardly significant. Unless sizeable increase in production takes place, India cannot hope to enter the world trade for this item. During the Survey it was learnt that world trade in grapefruits was not rising primarily due to inelastic supplies and that consumption of grapefruits can be increased provided large supplies were forthcoming. In view of this position it is recommended that India should immediately plan to enlarge the area under cultivation of grapefruits in Rajasthan and Punjab. Here it is suggested that before embarking upon such a plan, a complete comprehensive examination of the feasibility of growing grapefruits in India on a commercial basis for export purposes, should be undertaken.

(d) Mandarin Oranges. Market for mandarin orange segments has been discussed in the latter part of the report. There is a growing market for mandarin orange segments in the world, dominated presently by Japan. The Survey has revealed that India can profitably enter this market, as it commands the necessary capabilities to grow and process mandarin oranges. Satsuma variety of seedless mandarins has been successfully grown in the experimental research farms in Coorg area. The results have been encouraging and it is believed that India can become one of the most important producers of mandarin oranges in the world. Large quantities of good root stocks suitable for graftings are also produced in the experimental farms. However, the number of fruit bearing trees being presently limited to 71, it is considered necessary that efforts should be directed for enlarging the production of satsuma variety of oranges in India. A comprehensive and integrated programme covering the plantation of new groves, production of nursery stocks with suitable root stocks and grafting material, needs to be formulated. Financial, technical and marketing assistance will need to be provided to the growers who may opt to plant these new varieties in Coorg as well as in other areas. A study may also be undertaken for ascertaining the areas where necessary soils and climates suitable for this variety obtain.

B. CITRUS PRODUCTS

Background

Besides sizeable consumption of citrus fruit in fresh form, considerable quantities of citrus fruit comprising mainly oranges, grapefruits and lemons are being increasingly processed in the major citrus growing countries of the world. Recent years have witnessed a rapid growth of a very extensive processing industry in USA and the Mediterranean area. According to available indications, the processing industry is likely to become a more promising outlet for the disposal of fresh fruits in future.

Principal factors governing the rapid development of citrus processing industry in the world include i) availability of large quantities of culls not considered suitable for exports as fresh produce; ii) changing food habits in the world favouring the consumption of processed foods which are more convenient to buy and store; iii) possibility of utilising a larger proportion of the fruit for the production of a wide range of products including industrial juices, concentrates, frozen juices, etc which yield higher unit values; iv) development of a large-scale by-product industry including peels and pulps contributing substantially to economies of scale.

The above factors have led to the development of a citrus industry aimed at processing the fresh fruit in a way so as to preserve its nutritional value and rendering it easier to supply without damage. In some of the citrus producing countries of the world, the processing industry is becoming a very important outlet for the disposal of fresh fruits and vegetables. For instance, till 1950s Florida supplied only 15 million cases of fruit for processing as against 100 million cases of fresh fruits (which is equal to about 3 million tonnes of fresh fruit), at present. On an average, the proportion of fruit utilised by the American processing industry is reckoned at 70% of the total crop. The average utilisation of fruit by processing industries in other major citrus growing countries of the world has currently been estimated as follows:

	Percentage Utilisation in Processing Industries of Major Countries 41/
Israel	25%
Japan	25%
Italy	13%
Greece	12%
Spain	10%

Citrus products can be broadly classified into the following categories:

i) Juices
ii) Mandarin orange segments and grapefruit sections
iii) By-products including peels etc.

World Production

While data on world production of citrus products are not available, output of juices and segments in some of the major producing countries including USA, Israel, Spain, Italy, Japan, Greece, Australia and South Africa together accounted for over 80% of the world production of citrus products, in 1966.

41/ Field Survey

USA constitutes the most important manufacturer of both canned and frozen citrus juices; production during 1966 at 1.6 million tonnes accounted for over 70% of the total production of citrus juices in the world. Production has, however, been on the decline in the recent past, falling from 500 million gallons (2.5 million tonnes) in 1958-59 to 330 million gallons (1.6 million tonnes) in 1966, owing mainly to the frost damage to the citrus crop in Florida in the recent past. Production of citrus juices in USA has since been showing an upward trend on account of the concerted steps undertaken by the Florida canners. Trade circles predict that the coming years will witness a complete recovery in the production of juices in USA.

Israel with approximately 75,000 tonnes of citrus juice production, ranks as the second largest producer in the world. Production of fruit juices in Israel has been going up and in view of growing acceptability of her juices in the world and rationalization of the industry, production is likely to multiply in the next few years.

Mandarin orange segments, the output of which was around 225,000 tonnes in 1966, are mainly produced in Japan, followed by Mainland China, Spain and Taiwan to a limited extent. Japan holds almost a virtual monopoly in the manufacture of mandarin orange segments, accounting for over 95% of the total world production. Production of grapefruit segments amounted to 85,000 tonnes in 1966, mainly emanating from USA and Israel, the former having accounted for over 50% of the world output of this item

In view of the growing nature of the world market for citrus products, countries like Brazil, Morocco, Mexico, Algeria and Ghana are also expanding their production with a view to capturing a larger share of the world market.

World Exports

Total exports of citrus juices comprising orange, grapefruit, lemon and blended grapefruit during 1965 were estimated to be around 0.5 million tonnes on single strength basis, orange having accounted for over 60%. The table given below presents the exports of citrus juices of the major producing countries:

Exports of Citrus Juices by Major Countries[42/]

(Million gallons)

	Orange	Grapefruit	Lime	Blended	Total
USA	6.6	2.5	1.2	1.4	11.7
Israel	6.2	2.8	0.4	2.2	11.6
Italy	3.4*	-	-	-	3.4
Spain	2.4*	-	-	-	2.4
Greece	1.8*	-	-	-	1.8
South Africa	1.7	-	-	-	1.7
Morocco	1.5	0.7	- -	-	2.2
Jamaica	0.8	0.5	0.5	-	1.8
Trinidad	0.7	1.0	0.1	-	1.8
Algeria	0.1	0.1	-	-	0.2
Australia	0.1	0.1	-	-	0.2
	25.6	7.3	2.2	3.6	38.8

*Includes exports of other citrus juices as well.

[42/] The European Market for Citrus Juices, GATT International Trade Center, Geneva, 1966.

Total exports of citrus juices in 1964 were 38.8 million gallons or about 0.2 million tonnes. Orange juice with an export of 25.7 million gallons (127,000 tonnes) constituted the leading export item followed by grapefruit juice (35,000 tonnes) and lime juice (10,000 tonnes), USA and Israel together accounting for over 50% of the total exports.

Mandarin orange segments, the second largest citrus product in the world trade, are manufactured and exported mainly by Japan. Taiwan, Spain and China (Mainland) have, however, emerged as competitors to Japan during the last five years though their share of the world exports is not considerable. Total world exports of mandarin orange segments were estimated at 75,000 tonnes during 1966, Japan accounting for 65,675 tonnes (85%). Exports of Japanese mandarin orange segments have been steadily rising, from 3.4 million cases (51,300 tonnes) in 1962 to 4.4 million cases (64,858 tonnes) in 1965 and 65,675 tonnes in 1966.

Grapefruit segments are principally manufactured in USA and Israel, though only Israeli products enter the world market in a substantial way. Israeli grapefruit segments were exported to the extent of 8,888 tonnes in 1964, declining to 7,539 tonnes in 1965. Exports, however, are reported to have picked up during 1966 reaching the level of 10,000 tonnes. US exports of grapefruit segments which form but an insignificant proportion of the world trade, declined from 3,300 tonnes in 1962 to 100 tonnes in 1964, a major proportion of US production being consumed locally.

World Consumption

The consumption of citrus products in general and citrus juices in particular has been rising all over the world; the West European markets in particular have been witnessing a significant growth since 1960. According to the study undertaken by GATT International Trade Center, consumption of juices in continental Europe has risen from 1.20 million tonnes to 1.75 million tonnes between 1959-60 and 1964-65, thus indicating an annual growth rate of about 6%. The table given below presents the imports of West Europe including UK between 1960-65:

Imports of Citrus Juices into West Europe[43]

(Thousand Tonnes)

	1960	1962	1963	1964	1965
UK	91.0	75.0	66.0	87.0	89.0
Germany, West	57.6	74.8	85.6	85.0	85.0
Sweden	16.5	16.5	15.5	15.9	17.1
Switzerland	16.2	8.4	8.8	10.5	11.8
Netherlands	11.7	13.7	17.2	20.3	24.8
France	9.5	14.7	17.3	15.6	17.4
Denmark	6.9	13.1	13.1	12.1	14.3
Norway	4.7	6.0	6.8	6.1	8.8
Belgium	4.3	2.0	5.6	4.9	3.3
Austria	3.1	4.0	3.7	4.8	5.3
	221.5	228.2	239.6	262.2	276.8

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[43] The European Market for Citrus Juices, Op. cit.

The above figures have been calculated on the basis of single strength juice, though approximately 59% of all citrus juices are imported in the form of concentrates. This would be evident from the table given below indicating imports of single strength and concentrated juices into Europe during the period 1962-65:

Imports of Citrus Juices into West Europe by Varieties 44/

(Thousand Tonnes)

	1962		1963		1965	
	Single Strength	Concentrated	Single Strength	Concentrated	Single Strength	Concentrated
UK	47.0	5.5	45.0	4.5	57.0	6.5
West Germany	20.5	10.9	18.2	13.5	NA	NA
France	12.1	0.5	13.2	0.8	15.4	0.4
Sweden	3.8	2.5	3.6	2.4	4.0	2.6
Switzerland	2.7	1.2	3.0	1.2	3.1	1.8
Austria	2.3	0.3	2.5	0.2	2.8	0.5
Belgium	1.7	0.1	1.7	0.8	2.2	0.2
Denmark	1.0	2.4	1.0	2.4	1.1	2.6
Netherlands	0.7	2.6	0.8	3.3	1.2	4.7
Norway	0.2	1.2	0.3	1.3	0.3	1.4
Total	92.0	27.2	89.3	30.4	87.1	20.7

UK and West Germany constitute the most important consuming markets both for single strength and concentrated juices having accounted for 75% of the single strength juice imports and 60% of the citrus concentrates in 1965. France, though a big importer of single strength juices, does not import sizeable quantities of concentrates. On the other hand, Denmark, Netherlands, Switzerland, Norway and West

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44/ The European Market for Citrus Juices, Op. cit.

Germany are sizeable markets for concentrated juices in view of the ever expanding juice re-constitution industry in these countries. Table given below indicates the relative position of concentrates vis-a-vis single strength juices during 1965:

Percentage Shares of Single Strength and Concentrated Juices in Major Markets 45/

(Thousand Tonnes)

	% share of total imports in 1963	
	Concentrates	Single Strength Juices
Netherlands	95.3	4.7
Germany, West	77.7	22.3
Switzerland	72.8	27.2
Denmark	72.4	27.6
Norway	72.1	27.9
Austria	47.5	52.5
Sweden	46.9	53.1
UK	36.2	63.8
Belgium	31.1	68.9
France	10.6	89.4

The rise in per capita consumption of citrus juices in the major European countries would be evident from the table given below:

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45/ European Market for Citrus Juices, Op. cit.

Per Capita Consumption of Citrus Juices in West Europe [46]

(Thousand Tonnes)

	1959	1965
Sweden	1.90	2.25
UK	1.60	1.65
Denmark	1.21	3.05
Switzerland	1.18	2.05
Norway	1.16	2.40
France	1.14	0.36
Netherlands	1.03	2.08
West Germany	0.98	1.47
Belgium	0.54	0.55
Austria	0.36	0.75

It would be seen that the largest rise in consumption has taken place in Denmark, France, Norway, Netherlands and Austria during the period 1959-65. The remaining countries have also shown moderate increase in per capita consumption.

Supply

Citrus juice requirements of West Europe are mainly met through suppliers from the Mediterranean countries, Israel accounting for the major share. This position has been clearly brought out by the following table:

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[46] European Market for Citrus Juices, Op. cit.

Exports of Citrus Juices by Major Sup
to European Markets 47/

(Thousand Tonn

	1962		1963		1965	
	Qty	%	Qty	%	Qty	%
Total	61.19	100	63.44	100	66.10	100
of which						
Israel	11.02	18.0	17.20	27.1	23.71	35.9
USA	38.25	52.7	21.25	35.5	11.18	16.9
Morocco	4.82	7.9	5.93	9.3	8.81	13.3
Greece	0.96	3.6	0.91	1.5	5.81	9.2
Italy	5.80	9.5	6.66	10.5	6.72	10.2
Spain	4.11	6.7	4.87	7.7	5.00	7.6
South Africa	0.36	0.6	0.77	1.2	3.21	4.9
Algeria	2.66	4.3	3.88	6.1	0.35	0.5

Israel has emerged as the single largest supplier of citrus juices to Europe mainly at the expense of USA whose share in the European markets declined from 53% in 1960 to 17% in 1965. Israel's share, on the other hand, rose from 18% to 40% of the total over the period. The steep decline in US exports of citrus juices to Europe is partly attributable to the setback suffered by her industry after the Florida frost in 1962. Morocco, Greece and South Africa have also improved their exports considerably to Europe during the last five years mainly on account of the gap created by the short supplies from USA during the period. Algeria was the only country whose market share declined from over 4% in 1962 to 0.5% in 1965. It is significant to note that Israel has managed to obtain a very substantial share of the market despite the emergence of numerous countries like

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47/ European Market for Citrus Juices, Op. cit.

Morocco, South Africa, Greece and Brazil as serious contenders for the European market. Israeli single strength juices in particular have been able to develop a brand following in most of the European countries, mainly on account of a consistent good quality product, efficient and wide-spread distribution system and competitive prices as compared to US quotations.

The analysis of the European market as given above indicates that the European market for citrus juices is mainly oriented towards juice concentrates. Europe presents a growth market for citrus juices and the rising consumption trend is expected to continue over the next decade. The market for single strength juices, which is actually contracting, is dominated presently by national brands like Libby's,Del Monte and Jaffa. Furthermore, with the establishment of a large number of juice re-constituion plants in various European countries, the imports of single strength juices are likely to contract further in the future years, juice concentrates having much higher growth potential.

Industries in Selected Countries

A review of citrus industries in some of the major countries is presented below:

Japan

Mandarin orange segments constitute a growing item in the international trade of processed fruits and vegetables, Japan having dominated with virtual monopoly, since long. Mandarin oranges, though basically of Chinese origin, have been developed into Satsuma variety in Japan.

This is a seedless and succulent variety which is easier to peel as compared to Florida and Mediterranean tangerines and also eminently suited for canning. Being seedless, it can be canned in its original shape and appearance.

Production. Mandarin orange orchards have been mostly developed in the Pacific Coast of Japan and approximately 126,800 hectares were under cultivation in the country in 1966. The area having fruit yielding trees extended over only 69,200 hectares and production was estimated at 1.75 million tonnes during 1966.

With the earlier plantations coming to maturity in the next few years, the production of mandarin oranges is expected to multiply manifold in the years to come. Japan holds the world record for commercial production of mandarins with an average yield of 20 tonnes per hectare, though in certain areas it goes up to 32 tonnes. The field is expected to rise owing to the supply of superior fertilizers, excellent irrigational facilities, collective research undertaken for higher yields and easy availability of fumigation facilities for combating pests and diseases. Of the total production of 1.75 million tonnes of mandarins in 1966, 83% was consumed locally in fresh form and another 1% exported fresh, the remaining having been processed in the form of segments, juices, squashes and concentrates. It is further understood that 83% of the fruit given over to the processing industry, was utilised for the manufacture of segments.

It is, however, known that the volume of fruit supplies to processing industry in Japan has been on the decline mainly on account of the following factors:

i) Rapidly increasing labour costs in Japan resulting in higher selling prices and consequent reduced demand in world markets;

ii) Emergence of Spain and China (Mainland) as competitors to Japan;

iii) Decrease in the purchase of segments by USA, the leading buyers of Japanese segments in the world market.

The proportion of the fruit being utilised (now about 16%) is expected to decline further in the future, owing to the factors enumerated above. Moreover, the growing shortage of relatively poor soils of rather steep sloping topography, where mandarin trees have been grown traditionally in Japan, has been noticed recently. Such soils require increasingly high use of inputs and a stage seems to have been reached when these highly expensive inputs are not producing correspondingly sufficient increases in yields. These conditions make new plantations of mandarin groves a less sound economic proposition. In view of this and the emergence of other countries as suppliers of segments, once the monopoly of Japan, it is expected that Japanese exports may decline in the future creating a gap which can profitably be filled by new entrants having the capabilities to grow and process mandarin oranges.

Exports. The table given below presents the volume of domestic consumption and exports of mandarin orange segments in Japan:

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Domestic Consumption and Exports of Japanese Mandarin Orange Segments 48/

(Thousand Tonnes)

Year	Exports	Domestic Consumption	Total
1962	3,420	4,630	8,050
1963	3,920	3,050	6,970
1964	4,510	3,500	8,010
1965	4,438	7,000	11,438

In addition to the above, mandarin juice was exported to the extent of 60 tonnes in 1966. The following table gives the direction of exports for 1964-66 in respect of mandarin segments:

Direction of Exports of Japanese Mandarin Orange Segments 49/

(Tonnes)

	1964	1965	1966
USA	23,473.3	25,080.9	27,905.5
UK	21,909.6	21,750.6	19,782.5
West Germany	7,664.9	10,082.8	10,001.2
Netherlands	2,443.5	3,234.4	2,826.5
Canada	1,660.7	1,940.7	2,206.1
Sweden	823.5	985.8	1,148.5
Belgium	533.3	461.7	555.6
Denmark	238.5	353.8	359.2
Norway	86.3	80.6	75.6
France	39.5	2.1	-
Australia	29.2	43.0	52.7
Singapore	26.6	35.2	16.6
Total (inclu- others)	59,645.2	64,858.0	65,675.6

48/&49/ Trade Statistics of Japan

It would be seen from the above that though exports of segments have been growing during the past three years, the rise between 1965-66 was marginal. USA is the leading buyer of Japanese segments having accounted for approximately 40% of the total exports followed by UK and West Germany. These three countries together imported 86% of the total exports of Japanese segments in 1966.

Can Sizes. The sizes of cans utilised for packing segments in Japan are as follows:

Type	Weight (gm)
Special No. 1	3,120
No. 2	850
No. 4	455
No. 5	312
No. 7	300

While artificial sweetening agents are used in the manufacture of mandarin segments meant for domestic market, sugar is added to the packs destined for export markets.

Procurement of Fruit. Japanese canners purchase two varieties of oranges, small size for juice and large size for segments. Prices to the canners are normally lower in view of their bulk purchases mainly in 30 kg packs; the prices paid by the canners were Yen 45.60 ($0.13) per kg as against wholesale price of Yen 100 ($0.28) per kg in the open market during 1966.

2) Israel

Israel constitutes one of the most important producers of citrus fruit in the world, having recently emerged as a major trading partner in the world trade of fresh and processed citrus.

The Industry. Citrus processing has been growing rapidly in Israel with sizeable quantities of processed citrus entering the world markets. The rapid increase of the citrus crop has led to the establishment of a well organised citrus processing industry in the country. Increasing production of fresh fruit also necessitated a rigid supervision over the quality of the produce destined for export markets owing to the growing competition as well as consumer's insistence on quality product. With quality control for export consignments becoming more rigorous, a large quantity of fruit rejected as unsuitable for exports was utilised by the processing sector.

The processing industry of Israel has, in the recent past, emerged as an important economic entity in its own right and today most of the factories operating in the citrus field have modern equipments and machinery with the capacity to process and market sizeable quantities of citrus products. The industry which had only 2 plants before the Second World War has presently a large number of units, whose products have been well established in the European markets. Majority of the units in Israel, however, are small and medium sized operations with their production mainly oriented towards domestic market. In addition, there are 8 large scale factories each having a seasonal capacity of 20,000 to 40,000 tonnes of different lines of citrus products. During citrus off-seasons they undertake the preservation of vegetables and other fruits. It is estimated that these 8 factories absorbed about 60% of the fruit and vegetable crop diverted for processing in the country during 1964-65.

Fruit Utilization. The following table gives the quantities of culls available to the industry between 1958-59 and 1964-65 as compared to the total citrus crop of Israel:

Availability of Culls to the Citrus Industry in Israel 50/

(Thousand Tonnes)

	Total Production	Local Consumption (Tonnes)	Local Consumption (%)	For Processing (Tonnes)	For Processing (%)
1960-61	470	68	14	83	18
1961-62	490	67	13	83	17
1962-63	690	78	11	119	17
1963-64	760	80	10	241	31
1964-65	870	75	8	223	25

While domestic consumption of citrus fruit in the country has been on the decline from 14% to 8%, utilization in the processing sector had risen from 8% to 25% during 1960-61 and 1964-65.

Following data indicate the fruit requirements for the manufacture of a tonne each of selected citrus products in Israel:

Citrus Fruit Requirements per Tonne of Selected Products 51/

Product	Citrus fruit used (Tonnes)
Sterlised concentrated Juice	16.5 - 17
Single strength citrus Juice	2.5 - 3
Grape fruit Juice	2.5 - 3
Grapefruit segments	1

50/&51/ Citrus in Israel, Israeli Periodicals, Tel Aviv, 1966

A recent Survey undertaken by the Ministry of Industry in Israel has estimated the processing capacity at 300,000 tonnes of citrus fruit during the winter season, besides 60,000 tonnes of other fruits and vegetables. The productive capacity of the Israeli processing industry is thus reported to be sufficient to meet the present requirements.

Projections made with respect to the likely availability of culls by 1969-70 are given below:

Availability of Culls to the Industry by 1966-70 52/

(Thousand Tonnes)

	1966-67	1967-68	1968-69	1969-70
Shamoutis	143	154	157	163
Washington Navels	4	4	5	5
Valencia	35	38	40	42
Grapefruits	75	81	93	100
Lemons	13	13	15	15
Total	270	290	310	325

In the light of the above projection by 1969-70, the need for additional processing capacity is presumably under review by the Government.

Exports. As indicated earlier, Israel has been able to secure a 35% share in the European market for citrus products during the last 5 years, mainly on account of the consistently good quality of the Israeli product as well as its efficient overseas distribution system.

52/ Citrus in Israel, Op. cit.

The following table gives the product-wise exports of Israel, in terms of value during 1961-64:

Exports of Citrus Products of Israel[53]

(Million Dollars)

	1961		1962		1963		1964	
	Value	%	Value	%	Value	%	Value	%
Natural Juices	2.7	34	2.8	29	4.1	31	7.1	40
Concentrates	1.9	24	1.4	14	2.3	18	3.1	17
Segments	1.3	16	2.0	20	2.8	21	3.0	16
Communited Juices	0.6	8	0.8	9	1.2	9	2.1	11
Syrups	0.9	11	2.3	24	2.0	15	1.3	7
Frozen Concentrates	-	-	-	-	0.1	-	0.7	4
Bases	-	-	-	-	0.2	2	0.4	2
Others	0.5	7	0.5	4	0.5	4	0.4	3
Total	7.9	100	9.8	100	13.2	100	18.3	100

It would be seen that natural juices constitute the most important product in the citrus exports of Israel, having accounted for approximately 40% of the total exports in 1964 followed by concentrates 17% and segments 16%. The largest rise in exports has taken place in the case of comminuted juices.

In terms of volume, total exports of citrus products amounted to 242,000 tonnes in 1964 as against 108,000 tonnes in 1959 indicating a rise of 103% over the period. FAO has projected that by 1970 the Israeli production of orange crops will be in the neighbourhood of one million tonnes, of which 260,000 tonnes (in terms of fresh produce) of orange by-products will be exported to overseas markets, domestic consumption of fresh as well as processed fruits being placed at 150,000 tonnes.

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[53] Citrus in Israel, Op. cit.

Problems. The citrus processing industry of Israel has been growing steadily and this trend is likely to continue in the coming years. The citrus products of Israel are well established in the European markets and despite the emergence of countries like Morocco, Brazil, Algeria and South Africa as important suppliers to Europe, Israel has been able to secure a very substantial chunk of the European demand for citrus products. The industry is, however, confronted with the following problems:

i) In the absence of direct link between the canners and growers, the canning units are handicapped inter alia in their production planning and export pricing;

ii) Unlike fresh citrus marketing, exports of citrus products are directed through a number of factories operating in Israel due to the absence of a centralised marketing agency. The maintenance of small plants operated by relatively less modern methods is proving a drag on the industry, in terms of cost reduction, quality control, standardisation, packaging, etc.

The Government of Israel is reportedly contemplating the constitution of a central organisation on the lines of the Citrus Marketing Board for handling the exports of processed products.

3) Spain

The Survey revealed that about 10% of the total citrus crop is utilised for processing in Spain, the remaining 90% making up for exports and local consumption. The proportion of fresh fruit used for processing in Spain is relatively low as compared to 75% in USA and 25% in Israel. Except for the draught years, when large quantities of fruit are rejected as unsuitable for export markets, the processing industry in Spain normally does not get adequate supplies of citrus at reasonable prices. It is in this connection that the FAC report on Spanish Agriculture has recommended the need for increasing plantations of double performance varieties since the processed market for exports is growing at a faster rate than fresh citrus market.

The Industry. Considerable production of fresh fruits and vegetables in the country has led to the establishment of a sizeable processing industry. The Spanish processing industry is, however, characterised by the existence of a large number of uneconomic units which to a large extent have come in the way of increased exports. Steps are therefore being taken by the Spanish Government for the formation of manufacturers' consortia in the country. In citrus, however, large-scale modern operations exist in the country which are principally active in the export trade, accounting for a substantial proportion of the total production and exports. There are about 76 canning units specialising in citrus products, the spread of which is as follows:

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Area	No. of Units[54]
Valencia	50
Castlow	15
Murcia	8
Seville	2
Hhelve	1

Production and Exports. The output of citrus products during 1965-66 and 1966-67 was as follows:

Output of Citrus Products in Spain[55]

(Thousand Tonnes)

	1965-66	1966-67
Juices (Single strength and concentrates)	26.5	29.4
Other Products	13.6	15.5
Total	40.1	44.9

The total value of production during 1966-67 as can be seen from the above table was around $ 85 million. Whereas the above data relates to both single strength and concentrated juices, the total production of citrus juices on single strength basis has been estimated to be of the order of 65,000 tonnes in 1966-67.

Exports of citrus products during 1965-66 were as follows:

(Next page)

54/ & 55/ Field Survey

Exports of Citrus Products in Spain[56]

	1965	1966
Single strength Juice	4,203	5,457
Concentrated Juices	5,310	4,542
Citrus Peels	3,237	3,463
Essential Oils	463	125
Total	13,213	13,587

Exports of citrus products rose marginally between 1965 and 1966. While the exports of single strength juices increased by 31% over the period, those of concentrated juices and essential oils declined considerably. UK and West Germany constitute the most important buyers of Spanish products, having accounted for over 60% of the total exports in 1966. Trade circles opined that exports during 1967 were relatively higher than in 1966.

Cost of Production. It has been mentioned earlier that procurement of the right quality of fruit at reasonable prices is difficult in Spain owing to the higher returns realized for fresh citrus exports. The Survey revealed that Spanish citrus processors paid on an average Pesetas 2.70 ($ 0.39) per kg of fresh fruit as compared to Pesetas 1.17 ($ 0.17) per kg in competing countries like Morocco and Brazil. It was understood during the field survey that the cost of producing 65° brix of citrus concentrates in 6 kg cans comes to approximately Pesetas 56.50 ($ 0.81) per kg. It however needs to be kept in view that the citrus producing units in Spain besides manufacturing concentrates, also turn out considerable quantities by-products like peels and essential oils which increase the return per unit of oranges processed in the factory. However, the cost of production is comparatively higher as would be indicated from the export quotations of Spanish concentrates as compared to those of competitors given below:

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[56] Field Survey

Comparative Prices of Citrus Concentrates in Europe 57/

Item	Country	
Orange Concentrates 65° brix	Spain	DM 2.60-2.70 per kg (FOB (Valencia)
	Israel	DM 2.11 per kg (CIF Hamburg)
	Brazil	DM 2.8 per kg (CIF Hamburg)

Mandarin Orange Segments. Spain constitutes the only country in the Mediterranean area where efforts towards growing of Satsumas have met with success. Spanish production of Satsuma variety of oranges has been steadily rising, from 15,080 tonnes in 1961-62 to 44,200 tonnes in 1965-66. Production is likely to grow rapidly in the future years on account of the higher returns realized from this variety. Satsumas are increasingly being preferred by growers in Spain on account of the fact that it is an early crop and comes to harvest in October-November rendering it free from the danger of frost. It has also been found that Satsumas are easy to sell both in fresh form and processed form yielding higher returns to the growers, Pesetas 8 ($ 0.11) per kg on an average as compared to Pesetas 4-5 a kg for other oranges.

Two factories for the manufacture of Satsuma mandarin orange segments have recently been established in Spain with a capacity of 100,000 cases (48x11 oz)

57/ Field Survey

each, production during 1967 being 40,000 cases. The Survey revealed that one of the units has recently entered into an agreement with a leading Japanese firm for the manufacture of mandarin orange segments under Japanese label. It was known that a price of $ 6 per carton of 48x11 oz was offered to the Spanish canning unit.

Besides packing under Japanese labels, limited exports of Satsuma mandarin orange segments have been initiated by one of the canning units in Spain and approximately 300 tonnes were exported to West Germany during 1967. The quality of mandarin orange segments is considered to be acceptable and is at par with the Japanese products. Production is expected to reach the level of 100,000 cases by 1969-70.

The cost of production of one case of mandarin orange segments (48x11 oz) in Spain is as follows:

Cost of Production of Manufacturing One Carton of Mandarin Orange Segments in Spain 58/

	(Carton: 48x11 oz) (Pesetas)
Oranges (35 kg)	150.00
Sugar (2 kg)	14.00
Preservatives	12.00
Cans	110.00

(Contd next page)

58/ Field Survey

Other Packing	10.00	
Labour	150.00	
Miscellaneous	7.20	
Total	453.60	Pesetas or
	6.48	Dollars

It would be seen from the above that the cost of production of Satsuma mandarin orange segments in Spain works out to $ 6.48 per case of 48x11 oz, as against the average CIF price of $ 5.50 quoted by Japan in most of the European markets.

4) Italy

The citrus processing industry in Italy is one of the oldest in the world manufacturing juices, essential oils of oranges, tangerines, lemons and bergamotos as well as peels in brine. There are about 75 processing plants in Italy and Sicily engaged in the manufacture of citrus products, 10 of which account for 75% of total production of citrus juices and essential oils. The citrus processing plants are concentrated in the areas of Palermo, Meseana, Sicily and Calabria. While the plants at Palerme mainly process lemons, those in east coast of Sicily and Messana specialise in lemon and orange processing, Messana units mainly manufacturing industrial juices. In addition to large scale units, there are numerous cottage units in the growing areas engaged in the extraction of juices and oils by simple techniques.

Production. Data on the utilisation of citrus fruit in Italy indicates that the industry processes approximately 13% of oranges and 10% of lemons. As in the other countries, oranges and lemons are grown mainly for fresh market, processors mainly depending upon 'drops', 'grade outs' and 'rejects' for meeting their requirements.

Production of processed citrus in Italy has been as follows during 1964-66:

Output of Citrus Products in Italy[59/]

(Tonnes)

	1964	1965	1966
Juices	64,000	60,000	64,000
Orange	24,000	20,000	24,000
Lemon	40,000	40,000	40,000
Essential Oils	1,020	1,040	895
Orange	150	125	150
Bergamoto	190	190	130
Mandarin	80	75	65
Lemon	600	650	550
Other derivatives	12,650	12,000	12,000

Average production of citrus products has almost remained stagnant around 75,000 tonnes during 1964-66. Juices, it would be seen, constitute the single most important item, having accounted for about 83% of the total production in 1966. Other derivatives principally include peels in brine.

[59/] Ministry of Agriculture, Greece

Exports. Italian exports of citrus products comprise mainly orange and lemon juices and citrus derivatives. Citrus juice exports, mainly orange and lemon juices, amounted to 17,051 tonnes in 1966, lemon juice accounting for over 60% of the total exports. West Germany which is the largest buyer of Italian citrus juices, took approximately 40% of the total exports during 1966. Other important buyers include Netherlands and UK.

5) Greece

The Greek citrus processing industry is of very recent origin with 25 units engaged in the processing of citrus juices. Of these 16 units are of reasonably large size, with a production capacity of handling 100 tonnes of fruit per day.

Production. Total production comprising mainly orange and lemon juices, rose from 26,700 tonnes in 1963 to 34,000 tonnes in 1965, orange juice having accounted for 85% of the total. Though some quantities of single strength juices are also manufactured, the major part of the production is marketed in concentrated form normally ranging between 65° and 70° brix.

The primary source of juice is the common seeded orange called 'Blanca' which is generally available to the processors at Drachma ½ to 1 per kg. Lemons are available to processors at 1 Drachma ($ 0.30) per kg.

The juice content of Blanca orange by weight ranges between 35 to 38% of lemons 28 to 35%. The by-products of the industry include essential oils yielding on an average 2.3 to 2.7 kg per tonne of lemons and 3.6 kg of oranges. Discussions with processors also indicated that it requires 15 kg of oranges to produce 1 kg of 65° brix concentrate and about 13.2 kg to produce 1 kg of 60° brix concentrates. Greek oranges produce juice of good colour possessing high acidity.

Exports. Exports of Greek citrus products mainly compring brined citrón peels have exceeded 900,000 tonnes in the recent past. It is expected that Greece will continue to be a major source of brined and glace citron peels and relatively less important for essential oils of orange and lemon. Exports of citrus juices, a recent development in Greece, are expected to evince rapid growth in the coming years. Exports of citrus juices during 1965-66 are presented below:

Exports of Citrus Juices in Greece[60]

(Tonnes)

	1965	1966
Concentrated sweetened juices	287	707
Un-concentrated citrus juices	11,196	13,342
Other concentrated citrus juices	3,463	2,869
Total	14,946	16,918

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[60] Basic Statistics on Processed Fruits and Vegetables of survey countries, Volume IV, Table B-3. 11 of the Report.

Exports of citrus juices (both concentrated and unconcentrated) rose from 14,946 tonnes in 1965 to 16,918 tonnes in 1966. While major buyers of single strength juices include Belgium-Luxemburg, West Germany, Denmark and Czechoslovakia, concentrated juices are principally supplied to West Germany, U.K. and USA. Small consignments of citrus juices have also been going to Sweden and Canada.

The Survey revealed that Greek juices have not been able to make a dent in the European market due to the lack of a centralised marketing agency. Steps are now being undertaken to put the marketing and distribution system on a sound footing.

6) India

Production of processed citrus in India has been negligible, most of the fruit being consumed locally in fresh form. However, small quantities of citrus fruit are processed in the country by a few canning units, mainly comprising juices, orange segments and orange pulp. Data collected during the Survey revealed the following information about 61 surveyed units:

Production of Citrus Products in India[61]

	(Tonnes)
Orange pulp	45
Orange juice	266

(Contd. next page)

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[61] Field Survey

Orange squash	670
Orange syrup	388
Orange marmalade	166
Orange jelly	36
Lime juice	317
Lime squash	793
Total	2,681

Statistics given above relate to 61 large and medium scale units covered during the survey within the country, which reportedly account for 80% of the total production of citrus items in 1965-66. It would be clear that the production of processed citrus is insignificant as against the total production of fresh produce placed at 1.5 million tonnes.

Prospects for India

A brief review of the world production and trade in citrus products presented above has clearly shown the vast potential that exists for the export of citrus products comprising mainly citrus juices and mandarin orange segments. The world market for juices is mainly oriented towards concentrates and this trend is likely to continue in the future. India's exports of citrus juices have so far been negligible, but in view of vast potential offered by the world market and India's capability to grow and process right varieties of citrus fruit, it should be possible for India to export 10,000 tonnes of citrus juices, comprising 5,000 tonnes of concentrates and 5,000 tonnes of single strength juices by 1975-76.

Mandarin orange segments, as seen earlier, constitute one of the most important growing items in the world trade of canned fruits and vegetables. It has been noticed that in view of the problems currently faced by Japan in terms of production of mandarin oranges, exports from Japan may decline in the near future leaving scope for new entrants like India.

India's ability to enter the large and growing market that exists for canned mandarin orange segments depends mainly on the production of seedless oranges akin to Japanese satsuma variety. Experiments conducted in the Coorg farms have shown that India can produce satsuma seedless variety of mandarins with qualities and cost at per with Japan.

A few of the trees in the Coorg area are 10 years old, producing 4,000 to 6,000 fruits per tree. Besides, there are over 200 young trees (2 to 3 years old) of this variety each of which is capable of producing 400 to 500 pieces of grafting material for new plantations. It is also understood that certain other areas in India particularly Abohar in Punjab have the requisite soils and climates suitable for growing mandarin oranges.

C. Recommendations

With a view to developing a viable export industry to reach the targets envisaged above, following steps need to be initiated:

1) India's ability to enter mandarin orange segment market depends entirely on the growth of satsuma variety on an enlarged scale in India. While Coorg area has been found suitable for the growth of this variety, other area promising to grow this

variety need to be located. It is, therefore, recommended that a comprehensive feasibility study may be undertaken with a view to ascertaining the areas having suitable characteristics necessary for the growth of this variety. Selection of the location of the proposed citrus plants should also be indicated by the study from the points of view of procurement of fruit, availability of adequate water and electricity, labour and other necessary operational aspects.

ii) A comprehensive and integrated programme for the production of mandarin orange segments and concentrated juices needs to be evolved on the basis of the results of the above mentioned study. This programme would include the development of right varieties, granting of required assistance to the growers who may opt to cultivate these varieties, both technical and financial, and the establishment of three export oriented units especially for the manufacture of segments and juices.

iii) A study of the mandarin orange segment industry of Japan may be undertaken with a view to evolving a programme for the development of this industry in India. A team consisting of a food technologist and an horticulturist with specialisation in citrus, needs to be deputed to Japan for undertaking this detailed study. This study would cover all the aspects of mandarin orange segment production, right from the stage of procurement of fruit to the production and marketing.

iv) USA and Spain are the two leading citrus juice producing countries of the world. Detailed study of their industries may be useful for working out a similar programme in India. In this connection, mention may be made of the 'Plan Badajoz' undertaken by the Spanish Government in Badajoz and Seville valleys with the objective of developing 120,000 hectares of arable land for horticultural production. This plan has reportedly succeeded in increasing production and yields and thus bringing down the cost of production. A detailed study of the objectives and implementation of this programme would be extremely useful.

4.3 PINEAPPLES

Background

While as a canned fruit pineapple is second only to peaches in world exports, it is comparatively of much less significance in the fresh trade, which is dominated by fruits like citrus, bananas and apples. Of the estimated world output of some 3.5 million tonnes of pineapples, hardly 100,000 tonnes enter world market in the fresh form. For all its apparent robustness, pineapple is a very delicate fruit, requiring great care to be exercised in the matter of handling, packing, temperature and humidity control etc. The attendant risks are no doubt high but trade mark-ups in most importing countries are unduly high, rendering the fruit to be regarded as a kind of luxury. Besides, there is the general reluctance of housewives to undertake the trouble of preparing the fresh fruit for consumption, when canned pineapples are readily available at reasonable prices. The canned pineapple industry in major supplying countries is so well organised and trade so well established that most consumers in the importing countries tend to regard the flavour of the canned pineapples as the true flavour of the fruit, with the result that ready acceptance is not forthcoming for the fresh. Notwithstanding these deterrent factors, world trade in fresh pineapples is showing signs of increase in recent years.

A. Fresh Pineapples

World Production

Ecological Requirements. Climate and soil have a definite bearing on the quality of the fruit. Pineapple is essentially a tropical plant but is known to grow well in sub-tropical regions also. The fruit seems to grow with equal ease both near the sea coast and in the far interior (as borne out, for instance, by the experience in India), so long as the temperatures are not extreme. The optimum range of temperature for successful pineapple production is considered to be from 21 °C. to 23 °C. The pineapple needs a deep, well-drained soil, and given this condition, it grows well on a wide range of soils besides sandy loam which is commonly considered to be the best type of soil for pineapple; the only definite exception appears to be heavy clayey soil. The plant is also known to be tolerant to wide variations in rainfall, provided adequate cultural steps are taken for conservation of moisture in areas of low rainfall and efficient drainage is ensured in areas of excessive rainfall. However, to obtain the best quality of fruit and realize high yields, painstaking efforts are called for in the selection of suitable soil and variety, determination of the composition and optimum dosage of fertilizers to be applied, spacing of plants, water management, weed control and so on.

Varieties. There are several varieties of pineapples grown in different parts of the world, variously estimated between 40 and 90, but only a few are of commercial importance, including mainly Smooth Cayenne, Queen, Singapore Spanish, Red Spanish, Pernambuco, Ananas Amaritto and Vermelho. Of these, Smooth Cayenne is the most favoured variety for canning purposes, as evidenced by the trend in many countries with developing pineapple industries to switch over to this variety; important characteristics of this variety relate to a) its cylindrical shape and smooth and thin skin, contributing to reduced wastage in processing and b) its relatively high fibre content, which makes for good, firm slices.

Production. Accurate estimates of world production of pineapples are difficult to obtain as in many countries, considerable quantities of the fruit are grown by small holders, which are not reported in official crop statistics. However, estimates released by FAO show that world production of pineapples steadily increased from 3.2 million tonnes in 1961 to 3.5 million tonnes in 1965 as given below:[1]

World Production of Pineapples

(Thousand Tonnes)

Country	1961	1962	1963	1964	1965
Hawaii	955*	935*	935*	935F	935F
Thailand	450	321	303	260F	300F
Brazil	274	276	274	291	292
West Malaysia	229*	223*	295*	314*	355*

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[1] Production Year Book, FAO, Rome, 1966

Country	1961	1962	1963	1964	1965
Ghana	180F	200F	232	232	235F
Mexico	177	178	193	198	201
Taiwan	174	192	163	227	231
South Africa	136	103	111	111F	111F
Philippines	116	140	151	155F	176
Cuba	87*	100*	100*	100F	100F
Australia	75	79	85	83	88
Puerto Rico	50	52	59	60	73
Ivory Coast	23	33	44	44	48
Mantinique	12	14	18	21	20
Others	266	297	320	334	351
Total	3,204	3,143	3,283	3,365	3,516

* Unofficial figures
F FAO estimates

Hawaii produces 935,000 tonnes accounting for more than 25% of the total world production; next in order come Malaysia, Thailand, Brazil, Ghana, Taiwan, Mexico etc. However, the quantum of production does not correspond to importance in world trade in all the cases. For instance, Thailand and Ghana, which are credited with production of 300,000 tonnes and 235,000 tonnes respectively, hardly figure in world trade, either fresh or processed. On the contrary, South Africa, with a much less production of 111,000 tonnes is a major exporter of pineapples, both fresh and processed.

World Trade

Most of the major producing countries concentrate on canned pineapples and do not figure in the fresh trade, with the major exceptions, however, of Brazil and Mexico, which are leading exporters of fresh pineapples. Malaysia is the largest exporter of fresh pineapples, but its exports of about 50,000 tonnes comprise almost exclusively shipments to canneries in Singapore, which may be ignored in the discussion on trade in fresh pineapples. Small producers like Puerto Rico and Ivory Coast are of considerable importance in the exports of fresh pineapples. Latest data, available upto 1962, on exports of fresh pineapples from major supplying countries are provided below:

World Exports of Fresh Pineapples[2]

(Thousand Tonnes)

Country	1958	1959	1960	1961	1962
Mexico	19.0	14.4	16.3	19.6	25.3
Brazil	10.0	8.2	16.5	23.8	17.2
Cuba	35.5	30.5	22.5	14.8	4.2
Guinea	2.9	3.8	5.5	4.2	2.9
Ivory Coast	1.0	1.2	3.0	2.1	2.3
South Africa	3.6	3.3	3.5	2.8	2.7
Portugal(Azores)	2.5	2.4	2.3	2.2	2.2
Indonesia	2.0	2.3	2.3	1.4	0.5
Jamaica	0.6	0.2	0.2	0.1	0.1
Kenya	0.1	0.1	0.1	0.1	0.1
Australia	-	-	0.1	0.1	N.A.
Total	77.2	66.4	72.3	71.2	57.5

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[2] Fruit, No. 14, 1963, Commonwealth Economic Committee.

It will be seen from the above table that world trade in fresh pineapples showed a declining trend between 1958 and 1962. Cuba, which was the largest supplier of pineapples upto 1960 faded into comparative insignificance, accounting for no more than 7% of the total exports; this was mainly due to its cessation of trade with United States which used to provide a major outlet for its exports. Mexico emerged as the largest supplier of pineapples, improving its share of the total exports from 25% in 1958 to 44% in 1962. Likewise, increase in exports of Brazil from 10,000 tonnes in 1958 to 17,200 tonnes in 1962 is reflected in its share of world exports rising from 13% to 30%. Although comparative data are not available beyond 1962, some of the smaller producers seems to have expanded their trade considerably during the past few years. For instance, data collected during the course of the Survey show that exports of Ivory Coast to France alone reached a level of 7,900 tonnes in 1967.

United States is by far the largest importer of fresh pineapples. Of the estimated consumption of about 60,000 tonnes, bulk of the supplies come from Hawaii and the overseas territory, Puerto Rico, which do not figure in official statistics. Cutside supplies from these two areas, Cuba used to account for the major portion of the import requirements of USA, but with cessation of trade between the two countries in 1961, Mexico has emerged as the largest foreign supplier of pineapples to USA. Argentina is the second largest market for fresh pineapples, imports into the country averaging 14,100 tonnes during 1958-62; Brazil is the chief source of its supplies. France, West Germany, Canada and UK are important among other markets for fresh pineapples. Imports into principal importing countries during 1958-62 were as follows:

World Imports of Fresh Pineapples[3]

(Thousand Tonnes)

Country	1958	1959	1960	1961	1962
USA	45.5	40.2	37.0	24.4	24.1
Argentina	9.6	10.2	15.0	21.2	14.3
France	4.8	6.9	5.9	4.2	4.9
West Germany	1.4	1.9	3.3	3.6	3.5
Canana	4.7	4.1	3.6	3.9	3.3
UK	5.2	4.3	5.0	3.3	2.9
Belgium & Luxemburg	2.0	1.9	2.4	1.9	1.4
Soviet Union	0.9	0.6	1.0	2.2	1.4
Japan	0,1	0.7	0.9	0.7	0.9
Switzerland	0.6	0.7	0.7	0.7	0.8
Chile	0.4	0.4	0.2	0.2	0.4
Malaysia	2.0	2.3	2.3	1.4	0.5
New Zealand	0.1	0.1	0.6	0.4	N.A.
Total	77.3	74.3	77.9	68.1	58.4

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[3] Fruit, No. 14, 1963, Commonwealth Economic Committee.

Demand for fresh pineapples seems to have registered a tremendous rise in Japan during the past few years. According to the latest issue (No. 1-1968) of 'International Fruit Fruit World', Japan has emerged as the second largest importer of fresh pineapples, with imports of 11,172 tonnes in 1965 and as much as 21,191 tonnes in 1966, as against less than 1,000 tonnes until 1962. Of the total imports in 1966, Taiwan accounted for 17,000 tonnes, Ryukyu Islands for 1,749 tonnes and USA for 1,608 tonnes. Among the European countries, demand has been rising fastest in France; total imports of France went up from the average of 5,300 tonnes during 1958-62 to as much as 14,487 tonnes in 1967, of which roughly 2,000 tonnes were re-exported to other countries in Europe. Imports of important consuming countries covered in the Survey were as follows during the past few years:

Imports into Selected Survey Countries[4]

(Thousand Tonnes)

Country	1963	1964	1965	1966	1967
France	5,661	7,460	8,419	10,049	14,487
UK	2,957	2,960	2,694	2,772	N.A.
West Germany	2,198	1,996	2,162	2,067	N.A.
Italy	295	520	597	966	N.A.
Belgium-Luxemburg	100	156	245	393	574
Netherlands	43	102	160	117	288

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[4] a) Volume III, Basic Statistics on Fresh Fruits and Vegetables in Survey Countries.

b) International Fruit World, No. 1-1968, Aeschengraben (Switzerland).

Bulk of the imports into France come from its former colonies, particularly Ivory Coast, which accounted for 55% of the total imports in 1967. Brazil, Martinique, France (re-exports), Portugal (Azores) and Ivory Coast are the major suppliers of fresh pineapples to West Germany. Imports into West Germany averaged 2,100 tonnes during 1964-66, which is considerably below the level of 1960-62. However, if re-exports from France to West Germany, which amounted to as much as 1,400 tonnes in 1967 as against the average of about 400 tonnes during 1964-66, are any indication, there appears to be a new surge of demand for fresh pineapples in West Germany. This was confirmed during discussions held with West German trade circles. Demand in UK appears to be stagnant around 2,700 tonnes, appreciably lower than the 1968-60 level; South Africa is by far the the largest supplier of pineapples to UK. On the other hand, imports into Italy expanded more than three-fold between 1963 and 1966, amounting to 966 tonnes in the latter year. Likewise, the Benelux countries are showing definite signs of rising demand in recent years. Another country where consumption of fresh pineapples has been rising fast is Switzerland. Official import statistics are not available, but discussions with trade have revealed that imports of fresh pineapples into Switzerland are currently in the neighbourhood of 2,000 tonnes.

Prices

Average c.i.f. prices of imports of fresh pineapples into selected Survey countries during 1965-67 were as follows:

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Prices of Fresh Pineapples Imports[5/]

Country	Source	Average c.i.f. price ($/Tonne) 1965	1966	1967
France	Total	NA	330	316
	Ivory Coast	NA	329	311
	Cameroon	NA	296	294
	Guinea	NA	289	241
West Germany	Total	330	359	NA
	Brazil	158	152	NA
	Martinique	481	426	NA
	Azores	549	513	NA
	Ivory Coast	483	473	NA
UK	Total	342	378	NA
	South Africa	260	329	NA
	Azores	483	449	NA
	Kenya	384	548	NA
Belgium-Luxemburg	Total	510	489	475
	France (re-exports)	471	467	399
	Azores	573	537	606

Prices vary considerably depending upon the source, reflecting differences in quality. For instance, shipments from Azores (overseas territory of Portugal) fetch uniformly high prices, as the fruit are of very superior quality and are delivered in perfect condition. On the other hand, prices paid for Brazilian pineapples are uniformly low, as the

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5/ Volume III, Basic Statistics on Fresh Fruits and Vegetables in Survey countries.

quality of the Brazilian fruit is not considered high. Besides, prices relating to the same source of supply evinced considerable fluctuations over years, depending upon the supply position, which is in turn largely influenced by the market situation obtaining in respect of canned pineapples.

Industry in Selected Countries

A brief review is made below of the industry in Mexico, Brazil, Cuba, South Africa, Azores, Guinea and Martinique, which account for the bulk of world exports of fresh pineapples; of these, only South Africa and Mexico are of any importance in the field of canned pineapples, which will be reviewed in Part B.

Mexico. Mexico is one of the largest exporters of fresh pineapples, bulk of its exports being directed to USA. Both varieties, Smooth Cayenne and Red Spanish, are grown commercially, other varieties of local origin being of little importance from the export point of view. The Smooth Cayenne fruit, weighing on an average about 5 lb, is nearly cylindrical in shape, with a greater diameter near the base than at the top. When ripe, the skin is dark orange-yellow in colour, although in certain seasons, some green mottles may be present on fully mature fruit. The flesh is pale yellow or yellow-orange, with considerable variation in colour according to the environmental conditions. Flesh of the summer-ripened fruit is more yellow in colour and more translucent than that of the winter-harvested fruit.

The Red Spanish pineapple is rather square in shape, weighing between 2 and 4 lb. The flesh of this fruit is pale yellow, more fibrous than that of the Smooth Cayenne, and it has a spicy, acid flavour, quite different from that of the Smooth Cayenne and the Queen. The core is large relative to the size of the fruit, and this is a disadvantage.

Production of pineapples in Mexico is undertaken in both small holdings and large scale plantations. The small holders generally use very primitive methods of cultivation, with the result that there is considerable variation in the quality of the fruit marketed. Pineapples are harvested round the year in Mexico, although the main harvest, accounting for roughly half of the total crop, is normally produced during June-July.

USA has been the traditional market for Mexican pineapples, limited quantities being supplied to Canada. Mexico has been making efforts to enter the European markets in recent years, but shortage of refrigerated shipping space is said to be a handicap. Exports to USA comprise mostly bulk shipments, often the fruit being simply nested in wood woold in rail cars, which carry on an average 5,500 fruit.

Brazil. Official estimates indicate that in 1960 area under pineapple in Brazil was about 28,000 hectares, production being reckoned at 27,500 tonnes. Production is mostly in the hands of small-holders. Although tracts of suitable land exist in the country, expansion of pineapple cultivation is reportedly hampered by lack of adequate transport facilities from the growing areas to the main markets. Most of the production is consumed fresh locally or exported, mainly to Argentina; however, efforts are under way to develop the processing industry in the country.

There are several types of pineapples produced in Brazil, some of them growing wild, but the most important from the export point of view is the Abacaxis or Pernambuco. This pineapple approaches a rather elongated cylinder in shape; the flesh is pale yellow to white, juicy and tender, and although it is less acidic than the Smooth Cayenne, the flavour is good. The fruit has a small core, 1.5 to 1.9 cm in diameter, resembling the South African Queen variety in this respect. However, it does not seem to be a good shipper unless harvested when only half ripe. The peak season for pineapple in Brazil is December-January, but supplies are available round the year.

Argentina is the principal market for Brazilian pineapples, absorbing about 85% of the total exports. The preference in Argentina is for fruit cut with several slips, or 'filhotes' still attached to the stalk of the fruit, which, so the Argentine importers claim, afford protection to the fruit and prevent bruising during transit. However, buyers in Europe consider that the 'filhotes' not only represent unnecessary waste material but detract from the appearance of the fruit. In recent years, Brazil has been making efforts to enter the European markets, despite stiff competition from countries like Ivory Coast, Martinque and Portugal (Azores).

Cuba. Red Spanish is the principal variety produced in Cuba. During the fifties, Cuba was the largest exporter of fresh pineapples in the world, exports averaging 34,200 tonnes during 1953-58. However, with its cessation of trade with USA in 1961, which used to provide the major outlet for Cuban pineapples, exports of Cuba declined to as low a level as 4,100 tonnes in 1962, although the trade seems to have picked up subsequently, with increased exports to East European countries.

South Africa. Both the Queen and Smooth Cayenne varieties of pineapples are produced in South Africa, mainly in the Eastern Cape region. Only a very small proportion of the output (2.4% in 1962) is exported as fresh fruit. This is because bulk of the production goes for processing, and there is also considerable local demand for the fruit. In fact, many growers do not consider it worthwhile to enter the export trade, keeping in view the strict regulations in force to ensure that only quality fruit are shipped. It has been estimated that only 10-12% of the production of the Queen variety comes upto the export standards. Nevertheless, certain growers, particularly those at Uruzumbe on the Natal Lower South Coast, have successfully developed cultivation of pineapples primarily for exports, and have achieved a reputation over years for the consistent high quality of their fruit in overseas markets. One factor that has contributed to the success of these growers is their proximity to Durban, which facilitates quick transportation of the fruit from the plantations to the cooling sheds at the port, thus reducing to a minimum spoilage due to the fruit becoming overheated before it reaches the ship.

The peak period for South African shipments is January-March; about 15% of the total exports comprise the Smooth Cayenne variety, the balance representing the Queen variety. The Queen pineapple is a small fruit, usually weighing between 1 and 2 lb, which is a disadvantage, as this implies a high proportion of waste material. Good quality Queen pineapples, when properly ripened, are of pale yellow golden colour and have a very sweet flavour, which is favoured by most consumers. Besides, this variety is a better shipper than the Smooth Cayenne, as it is less susceptible to hazards of sea transport. The Cayenne fruit usually weighs between 3 and 4 lb and when fully ripe is orange-red in colour.

The pineapple export trade of South Africa is extremely well organised. Strict regulations are in force to ensure that substandard fruit are not exported from the country, which are listed below:

1) Pineapples shall be packed in single or double layers in boxes whose outside measurements are:

Cayenne Pineapple Box	-	length 26" width 16" depth - optional
Queen Pineapple Box	-	length 26" width 12" depth - optional

The boxes shall be new and clean and secured with cleats over the ends of the lid.

2) Pineapples shall be packed in wood wool. There shall be a thick layer of wood wool at the bottom and top of the box. These shall be adequate wood between the fruit.

3) Pineapples shall be exported in one grade only, namely 'Selected Grade'.

4) All 'Selected Grade' pineapples shall be in sound condition, true to variety, uniform in size, fully developed, mature but not over-ripe and of good colour, clean and free from injury, disease and infect infestation, bruises and other blemishes affecting their appearance.

5) No Queen pineapple shall weigh less than 1 lb; no Cayenne pineapple shall weigh less than 2 lb.

6) The whole crown shall be left on the pineapple in as sound a condition as possible; pineapples with multiple crowns or with excessively large crowns in relation to the size of the fruit shall not be exported. The crowns shall not exceed three-fifths of total length of crown plus fruit.

7) The Cayenne variety shall have not less than ½" and not more than 1" and the Queen variety not less than ¼" and not more than ½" of the butt protruding from the base of each fruit. All butts shall be cut. No butts shall protrude through the sides of the boxes.

8) The Government Fruit Inspector shall have the right to cut open the pineapples from one box in every 100 boxes or less in a consignment.

In recent years, however, the use of polythene as a packing material, and the shipment of Queen fruit of 15 oz or more in weight and Cayenne fruit of 30 oz or more in weight are being allowed.

UK is by far the most important market for South African pineapples, absorbing over 90% of the total exports. However, in recent years, South Africa has been making efforts to enter the EEC markets, particularly West Germany and Belgium. It has been reported that, shortage of refrigerated shipping space to European ports has been proving a handicap, inducing South Africa to explore the possibilities of sending the fruit by air. The success achieved so far, however, appears to be limited, particularly in the face of competition from Kenya which is much closer to the European markets and hence at a distinct advantage in respect of air freight.

Azores. Production of Azores consists mostly of the Smooth Cayenne variety, but of a strain known as 'St. Machael' Azores has a unique feature in that the plants are grown in beds, in batteries of glasshouses. Each plant receives individual care and attention so that a high proportion of quality fruit are obtained, which fetch a high premium price in European markets for their luxury value. The fruit is a rather squat, usually weighing between 5 and 6 lb, and when ripe has a bright yellow-red skin colour. Flesh of the fruit is yellow and reasonably sweet. The crown is rather small, which is considered an advantage as that makes the fruit appear much bigger than its true size. Another advantage of the Azores fruit is that the core is very small, meaning less of waste material. Export grades of the St. Machael fruit are as follows:

(Contd. next page)

Grade	Minimum Length	Medium diametre
Extra Choice	7 ½"	5 $\frac{29"}{32}$
Choice	6 $\frac{5"}{16}$	5 ½"
Standard	5 ½"	4 $\frac{23"}{32}$

Two sizes of wooden boxes are used for packing the fruit, measuring 41 x 21 x 9" and 21 x 20 x 9" respectively, of which the latter appears to be more popular with European buyers. The full box contains 8 to 16 fruit and the half box 4 to 7 fruit, all graded perfectly for size and appearance. The fruit are packed on a layer of wood wool or pine twigs, which are sometimes covered with blue tissue paper to improve the appearance of the pack.

The Azores pineapple is firmly established in the luxury fruit market, and shipments of varied volumes are made to most European countries. Total shipments from Azores, excluding consignment to mainland Portugal, have been in the neighbourhood of 1,400 tonnes in most years; exports in 1965, however, were lower at 1,162 tonnes. Total output of pineapples has been stable around 2,500 tonnes. The fact that the demand for the Azores fruit is confined mostly to the luxury trade in the European markets, taken together with the inherent limitations on the scope for expansion of production, explains the relatively small volume of exports from Azores.

Guinea. The variety of pineapple widely grown in Guinea is Baron Rothschild; it is closely related to the Smooth Cayenne, which is also produced in the country. Under natural circumstances, most of the fruit ripen during a relatively short period of three months, May-June; this has in the past often resulted in gluts. However, in recent years successful efforts have been made, through application of hormones, to extend the harvesting season. In fact, major part of the crop is now obtained from November to April, this has an added advantage in that the fruit which ripens during the dry season is considerably better in quality compared to that coming up for harvest during the monsoon season.

Most of the exports used to be directed to France until 1960, but in recent years shipments are increasingly being made to countries other than France, such as USSR and West Germany.

Martinique. Production of pineapples in Martinique has expanded in recent years and the industry is now well organised. The variety produced is Cayenne Lise, a sub-variety of the Smooth Cayenne. The fruit grown for the fresh trade normally weighs between 2 and 3¾ lb, and has a very small crown, similar to that of the St. Machael of Azores. Recently an improved method of packing the fruit has been developed in order to reduce bruising during the voyage. This consists in packing the pineapples upright, 12 fruit to a fibre board carton, which is sub-divided into sections so that each fruit may be placed in a separate compartment. Movement of the fruit inside the carton is reduced to a minimum by the attachment of cardboard collars. The cartons are so designed that they can be easily opened up for full display of the fruit to prospective buyers, thus reducing handling to a minimum. The fruit are usually packed in three grades: Grade A comprising fruit weighing between 1.5 and 1.8 kg, Grade B fruit weighing from 1.2 to 1.5 kg and Grage C fruit weighing between 0.9 and 1.2 kg.

Bulk of the fruit is exported to France, but it is expected that with the development of the pineapple industry in Martinique increased supplies will be available for export to other European markets.

India's Position

Production. Although large areas in India are reported to be ecologically suitable for growing pineapple, production of pineapples in the country is very limited. According to the estimates of the Directorate of Marketing and Inspection, total area under the crop in 1961-62 was about 7,830 hectares and output 76,000 tonnes. Assam and Kerala are the leading states in pineapple production, followed by West Bengal, Tripura, Orissa and Goa.

Varieties. Among the different varieties grown in the country, three are of commercial importance: the late variety, Kew (ripening in August-September), the early variety Queen (June-July) and the mid-season variety, Mauritius (July-August). Of these, the Kew, which is probably a hybrid strain of the Smooth Cayenne, is considered most suitable for canning purposes. On the other hand, the Queen, which has rich yellow skin colour, with flesh, attractive deep yellow in colour, very sweet, a little stringy and highly flavoured, is suitable as a table variety. Further details regarding the characteristics of these varieties are given in the technical note at Volume II, Annexure A-7, of the Report.

Special Programme. Bulk of the production is consumed locally in the fresh form, the proportion used for processing being about 10%. However, large quantities of pineapple produced in Assam go waste for want of adequate transport facilities. In the early sixties, fresh pineapples used to be exported in limited quantities to East Pakistan, but there are practically no exports at present but for some occassional trial consignments No serious efforts have been made to develop the pineapple industry in the country. It may be mentioned, however, that an expert committee constituted by the Union Ministry of Food and Agriculture has recently recommended, under a special pineapple production programme for export purposes, extension of area under cultivation by 12,500 acres (approximately 5,000 hectares) in the following states which are considered to provide suitable soil and climatic conditions: West Bengal (2,000 hectares), Uttar Pradesh (1,2000 hectares), Kerala (600 hectares), Mysore (600 hectares), Orissa (400 hectares) and Goa (20 hectares) Whatever the development programme to be drawn up and implemented, there are certain basic problems which require careful attention; these are discussed below.

Methods of Cultivation. There is a compelling need to improve the present methods of cultivation, so as to achieve economies in the cost of production. Pineapple is a neglected crop in the country. Bulk of the production comes from small holdings. In Kerala, for instance, where processing of pineapple is undertaken to a limited extent, it has been estimated that as much as 60% of the total output comes from holdings of less than a hectare, about 15% from the canner's estates and the balance 25% from backyards of private houses. The primitive methods of cultivation adopted should only be expected as a corollary to this situation. The growers usually reap four harvests (one plantation crop and three ratoons), with some manuring between crops, and then replant the crop. The yields are low, about 10-15 tonnes a hectare on the average, as against 60-70 tonnes per hectare obtained in Hawaii, Philippines etc, and the quality is indifferent. Most growers are not sufficiently enlightened nor have adequate resources to improve the methods of cultivation and improve their resources. The present cost of production of about Rs 200 per tonne of fruit must be regarded as high when compared to about Rs 110 in Ivory Coast and Rs 95 in Philippines (canners estates). The need for raising yields and reducing costs is apparent. In order to improve yields it is essential to obtain quality planting material, follow the close bed system of planting and provide adequate fertilizers.

Close Bed System. Growers should be disabused of their common notion that the fewer the plants per hectare, the better will be yields. Presently not more than 12,000 plants are planted per hectare in India, whereas experience in other countries has shown that yields can be improved substantially through the system of close bed planting. For instance, in Ivory Coast it is common to have 40,000 plants per hectare, and in Philippines 62,000 plants are planted per hectare in the canners' estates. Experiments conducted in the Fruit Research Stations in Kerala and Mysore also have proved that considerably better yields could be obtained with 35,000 - 38,000 plants per hectare.

Extension of Harvesting Season. While there are periods of peak production depending upon the variety and climate, it is now almost universal to extend the season through application of hormones and harvest the fruit nearly round the year. Although there is awareness of this practice in India, scarcely any attempt has been made in this direction. It is necessary to be able to obtain the fruit round the year for trade in fresh pineapple, but this is an even more essential prerequisite for success in the canning operations, which will be discussed in Part B.

Prospects for India

World trade in fresh pineapples is less than 100,000 tonnes at present, excluding shipments from Malaysia to Singapore; and the competition is fairly stiff. But judging from recent trends in countries like Japan, France and West Germany, demand appears to be on the rise; and, what is more important, there is ample scope for stimulating demand through promotional measures. It may not be possible to export large quantities, as in the case of bananas or citrus, but if India can develop an export trade of even 5,000 tonnes over the next 10 to 15 years, it will be well worth the effort.

Some of the production problems to be tackled have been discussed above. The presence of a large number of small holders in the field is a major factor to reckon with. Ideally, it would be desirable to encourage large scale holdings and develop production on regular plantation basis, so that higher yields could be realised through improved methods of cultivation+. Exemption of pineapples from the purview of this act will go a long way in setting the industry on sound lines; it may be mentioned that canners in Kerala contacted during the Commodity Study have evinced been interest in having their own plantations.

An alternative to large scale holdings would be to encourage formation of growers' cooperatives who should be provided with the necessary technical guidance and financial assistance and assured of a minimum price per tonne of fruit. The last provision is essential because distress sales in glut periods are of common occurrence in many areas. This calls for an effective marketing organisation. From the additional area of 5,000 hectares to be brought under the crop as envisaged

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+Pineapple canneries in Malaysia are statutorily required to own a minimum plantation of 1,500 acres (607 hectares each).

in the special programme for export production referred to above, a yield of at least 250,000 tonnes should be expected, as it should be an objective of the programme to realize higher yields per hectare, through the application of modern cultivation practices. The major portion of this additional production would have to be diverted for processing, as demand for fresh fruit in overseas markets is comparatively much less. Still, there would be appreciable quantities left which will need to be marketed within the country.

The foregoing leads to one conclusion, that is, in the event of relying upon the small holders for the increased output, there is need for an organisation which should take the responsibility of both organising production on modern lines and marketing the produce. This task can be entrusted to the proposed Fruits and Vegetables Export Corporation. The growers' co-operatives suggested above would have to be affiliated to this Corporation, on a selective basis. The main objective of the Corporation in this field will be to export fresh pineapples, tho function of marketing the fruit within the country being only a necessary adjunct to facilitate economic production.

For development of a sound export trade in fresh pineapples, the following are some of the major factors which need to be taken into account:

1) Colour and aroma are two important quality characteristics, influencing purcahse of the fresh fruit. When fully ripe, the fruit should have a clean, bright appearance and a deep golden yellow or bright, orange colour.

2) Crown is taken as an indication of the quality of the fruit. The crown should be straight and well developed. The crown leaves should

be turgid and green; leaves which are turning brown on the edges or are limp indicate staleness and detract from the appearance of the fruit.

3) Care should be taken to ensure that the fruit is harvested at the right stage. Fruit harvested too immature often have an aciduous taste and tend to develop a distinctly dully yellow tinge.

4) It is widely recommended that the fruit should be harvested only in the coolest part of the day. It is preferable to leave the fruit overnight in an open, dry, shady place, so that it can lose its field heat before packing. If the fruit is harvested when moist, it should be thoroughly dried before packing, otherwise mildew may develop on the skin surface.

5) Handling of pineapples, in harvesting as well as packing, requires very careful attention: even slightly excessive pressure of the fingers during packing can cause brusing which does not show for some ten or twelve days.

6) The fruit should be perfectly graded by size and appearance; pineapples in the range of 2-5 lb are popular in most markets.

7) When transported under refrigeration, care must be taken against chilling injuries. Exposure to temperatures below 45°F for ten hours is reported under certain conditions to cause the physiological disorder known as 'black heart'. Water logging or 'injection' is another defect which can develop as a result of excessive chilling.

8) Supplies should be made available round the year; this will be possible through suitable application of hormones to regulate the growth of the crop.

9) Exports should be built-up on the basis of volume and not profit margin. Excessively high margin of profit at various levels have been a major factor responsible for the relatively slow rise in world demand.

10) Point-of-sale literature aimed at impressing upon the housewives the ease with which the fresh fruit can be prepared for eating is likely to be a useful aid to promote sales.

Given an effective organisation, it should be possible to develop an appreciable volume of export trade in fresh pineapples. However, in view of the strong competition from other countries with an already developed industry, modest targets of 200 tonnes and 500 tonnes are suggested for 1970-71 and 1970-71 and 1975-76.

B. Canned Pineapples

World Production

As mentioned at the outset, pineapples are next only to peaches in the field of canned fruits. Output of canned pineapples has increased considerably during recent years, having amounted to 542,000* tonnes in 1962, compared with 353,000 tonnes in 1953. Latest statistics available indicate that production reached the level of 700,000 tonnes by 1966. USA (mostly Hawaii) is the largest producer of canned pineapples, accounting for over 44% of the estimated output in 1966. Taiwan, Malaysia, Philippines and South Africa are other major producers accounting for a further 38% of the total production. Pineapples are also processed to a lesser extent in Australia, Mexico, Ryukyu Islands, Ivory Coast, Martinique, Kenya and Cuba. Output of canned pineapples in different countries during 1960-62, together with estimates for 1966, is shown below:

Output of Canned Pineapples[6/]

(Thousand Tonnes)

Country	1960	1961	1962	1966 (Est.)
USA (Hawaii)	259	264	269	305
Taiwan	45	59	61	109
Malaysia	40	44	54	60

(Contd. next page)

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* This refers only to the solid packs comprising slices, cubes, chunks, tidbits and crush. Similar estimates for pineapple juice are not available, but the corresponding figure for juice would probably be close to 75 million gallons (single strength). Unless otherwise stated, figures in the sequel should be taken as relating to solid packs only.

6/a) Daisy E. Kay, A review of World Production of and Trade in canned Pineapple, Tropical Products Institute, London (1965) - for data relating to 1960-62.

b) International Fruit World, No. 1 - 1968, op. cit. - for 1966 estimates.

c) Field data - for 1966 estimates.

	1960	1961	1962	1966 (Est.)
Philippines	45	44	40	60
South Africa	38	48	42	40
Australia	22	16	21	40
Mexico (exports only)	16	17	17	21
Ryukyu Islands	13	15	15	20
Ivory Coast	4	4	5	20
Others (including Martinique, Kenya and Cuba)	21	20	18	25
Total	503	531	542	700

It will be noticed from the above table that substantial increases were registered in the production of Taiwan, Philippines, Australia and Ivory Coast. The output of USA also recorded an appreciable rise of 13% between 1962 and 1966, but as a result of the much faster rise in the case of other countries, the share of USA in total output declined from 50% in 1962 to 44% in 1966.

World Trade

About 50% of the total output enters the world markets. The five major producing countries account for more than 70% of world exports. As regards the importing countries, UK used to provide the largest market until the Second World War, but the share of UK is currently limited to about 15% of world imports. On the other hand, West Germany has in recent years emerged as the world's leading importer of canned pineapples. It is of interest to note that in spite of Hawaii being the largest producer of canned pineapples in the world, USA is a close second to West Germany in respect of canned pineapple imports. Other important markets include Japan, Canada, France, Netherlands and Belgium. The rapid rise in the imports of Japan during the past few years is noteworthy. The steady increase in world imports and the relative importance of different importing countries can be seen from the following table:

World Imports of Canned Pineapples[7]

(Thousand Tonnes)

Importing Country	1961	1962	1963	1964	1965
West Germany	51.8	71.8	54.6	62.8	71.3
USA	47.0	50.2	52.6	60.1	70.1
UK	57.9	67.8	53.3	57.4	55.3
Japan	23.8	23.3	27.1	35.3	42.9
Canada	20.5	20.3	25.8	25.0	22.1
France	13.9	16.1	16.1	17.7	20.5
Others	56.7	44.7	56.0	57.9	76.8
Total	271.6	294.2	285.5	315.2	350.0

Shares of major supplying countries in the total imports are shown below:

Shares of Major Suppliers in Total Imports[7]

(Percentages)

Supplying Country	1961	1962	1963	1964	1965
Taiwan	20.6	16.4	17.4	17.1	21.6
Malaysia and Singapore	17.0	14.2	17.5	16.4	17.4
USA	13.6	20.6	17.8	18.3	12.7
Philippines	10.7	13.4	10.3	10.9	11.4
South Africa	16.5	14.8	13.9	12.9	9.8
Mexico	4.5	5.9	6.2	5.1	5.8
Kenya	1.4	2.5	2.9	3.6	2.5
Others	15.7	12.2	14.0	15.7	18.8
	100.0	100.0	100.0	100.0	100.0

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[7] Private research organisation

It is, however, not possible to arrive at a meaningful ranking of different suppliers, because leading Hawaiian packers have large stakes in the industry in Philippines, Taiwan and South Africa, and to that extent exports of these countries (including USA) should be regarded as complementary to rather than competitive with one another.

Prices

Representative c.i.f. prices of canned pineapples obtaining at the time of the Survey (January-March, 1968) in some of the major importing countries are given below:

Importing Country	Source	Pack	c.i.f. price ($)
UK	USA(Libby's)	Slices--choice 24x2½	5.12
	USA(Delmonte)	Tidbits 24x2	3.60
West Germany	Philippines (Delmonte)	Slices - Choice 24x2½	6.30
	-do-	Crush 6x10	4.55
Sweden	Taiwan(Typhoon)	Slices - choice 24x2½	5.67
	USA(Dole)	-do-	5.64
	Ivory Coast	-do-	5.20
Denmark	Malaysia(Blue-pine)	Slices - fancy 36x10-oz	3.65
	-do-	Spiral - fancy 24x28-oz	5.60
	-do-	Spiral - Choice 24x28-oz	5.25

It will be seen from the above that there is a remarkable uniformity in prices, most of them falling within the range of $ 5-6 per standard case, thus reflecting the high degree of competition obtaining in this field.

Industry in Selected Countries

The processing industry in the five leading supplying countries, USA, Taiwan, South Africa, Malaysia and Philippines, of which the last two have been covered in the Survey, is briefly reviewed below:

United States (Hawaii). Production of fresh pineapples in Hawaii is currently believed to be of the order of one million tonnes, coming mostly from canners' own estates. Almost the entire production is utilised for processing. The variety of pineapples grown is Smooth Cayenne. The fruit is grown at an altitude of 500' to 1500' with the rainfall varying between 20" and 80" a year, and is known to be one of the most suitable varieties for processing. There are seven major packers in the field, of whom the most important are Dole, Libby's and Delmonte. Output of canned pineapples has been in the neighbourhood of 260,00 tonnes during the past few years.

The Hawaiian canned pineapple industry sells a large proportion of its output on the American domestic market, meeting about 80% of its requirements in respect of canned pineapples and 90% in respect of canned pineapple juice. For many years there was little or no competition from other producing countries in this market, thus ensuring a secure outlet for the industry's output. However, in recent years the American market has begun to import increasing quantities of canned pineapples from other countries, particularly low-cost producers such as Taiwan and Malaysia, and this has caused understandable concern to canners in Hawaii. Apart from large supplies to the domestic market in the United States, Hawaii exports considerable quantities of canned pineapple products to other markets. While there have been fluctuations from year to year, Hawaii is undoubtedly one of the leading exporters of canned pineapple products to world markets. Exports during 1961-65 averaged 50,300 tonnes; bulk of the exports are directed towards West Germany, Canada, Netherlands, Belgium and UK.

The Hawaiian industry runs on most efficient lines, with perfect co-ordination of all activities ranging from production of the fresh produce to marketing of the finished product. The industry has invested heavily in research and mechanization so as to keep unit costs of land and labour as low as possible, and has built up over years a reputation for quality. However, the industry is handicapped by its distance from the main consuming markets, including mainland US, and is faced with growing competition from countries like Taiwan and Malaysia whose cost of production is comparatively low. Where possible Hawaiian packers have developed subsidiary units in other countries which offer specific advantages contributing to reduction of costs.

Taiwan. Pineapple industry in Taiwan has been making rapid progress during the past few years, mainly through substantial financial and technical assistance from the United States. Taiwan is today the largest supplier of canned pineapple products to world markets. Taiwan's output, however, while being the second largest, is considerably lower than that of Hawaii.

The variety grown in Smooth Cayenne and bulk of the fresh production is in the hands of a larger number of small holders (90% in terms of area). Yields per hectare are reported to be very low although in recent years there has been some improvement, mainly as a result of governmental efforts. In an attempt to improve the efficiency of the industry, the Government have recently stipulated that each cannary should ensure that at least 30% of the fresh fruit requirements are met from its own plantations. About 75% of the output of canned pineapples comes from the six canneries belonging to the Taiwan Pineapple Corporation, the balance being accounted for by some 20 small canneries.

Bulk of the output is meant for exports, local demand being limited. Exports from Taiwan averaged 57,000 tonnes during 1961-65, touching the peak of 77,500 tonnes in 1965. Bulk of Taiwan exports consist of whole slices, choice grade slices representing roughly one-third of total exports. About 40% of Taiwan's exports are directed towards United States, and West Germany absorbs about 25%; other important markets include Netherlands, Japan and UK. Apart from lower production costs, Taiwan is in an advantageous position in respect of freight rates also vis-a-vis Hawaii. In fact, even in the case of USA, it is cheaper to ship from Taiwan to New York than from Honolulu to New York, though the distance is considerably more.

South Africa. The South African pineapple industry registered a rapid growth during the fifties, culminating in an output of 48,000 tonnes in 1961 as against the average of 10,000 tonnes during 1951-55. Production of fresh pineapples is mostly in the hands of large units, with growers producing fruit under contract with the canneries. Both the Smooth Cayenne and Queen varieties of pineapples are grown in South Africa, but commercial canning is based almost exclusively on the former. Although Queen is superior in colour and flavour, it has the disadvantage of lower yield per hectare as well as lower yield in processing. The South African industry has been carrying out considerable research for stepping up productivity, through the application of suitable fertilizers and closer spacing.

Processing units in South Africa may be classified into two groups: (a) large canneries producing pack of uniform quality with a high proportion of choice grade fruit, and (b) small canneries, which take up pineapple processing as one of several lines and, by keeping their overheads to a minimum and processing methods simple, produce a standard grade pack comprising a high proportion of tidbits, which can be sold at very competitive prices on the export market. Bulk of the output is exported, shipments averaging 40,800 tonnes during 1961-65. The United Kingdom is the traditional and largest market for South African canned pineapples. However, in recent years the industry has been able, through aggressive marketing (mainly by offering its products at very cheap prices), to develop other markets, including notably West Germany, Canada and USA.

Malaysia. Afrer the serious setback suffered by the pineapple industry during Japanese occupation of the peninsula, Malaysia has now regained its position as a major producer and exporter of canned pineapples.

Several varieties of pineapples are grown in Malaysia, but the canning industry is based almost entirely upon the Singapore Spanish variety. This fruit usually weighs from 2 to 4 lb and has a good flavour and colour; but its chief disadvantages are the deep irregular eyes which lead to considerable wastage in processing, and its relatively low acid content. This is perhaps the main reason why bulk of Malaysian production is confined to cubes and spiral slices. The main season in Malaysia for the fresh fruit is from May to July, with a second harvest at the end of the year. However, the use of hormones to control the development of the crop is now widely practised, so that the fruit can be harvested round the year.

Area under pineapple ranged between 11,700 and 15,400 hectares during the decade 1956-66, but production showed a substantial increase from 123,000 tonnes to 237,500 tonnes over the period. Bulk of the increase occurred in the sector held by small growers, which currently accounts for more than 50% of the total production. The rise was particularly steep during 1963-66: while area under small growers increased from 6,700 hectares in 1963 to 9,100 hectares in 1966, the corresponding rise in output was from 65,200 to 132,500 tonnes, implying increased productivity. Area under canners estates decreased from 5,700 acres in 1963 to 5,400 hectares in 1965, with a corresponding decline in production from 116,900 tonnes to 104,000 tonnes over the period. Average productivity in the canners estates remains, understandably, higher at 19 tonnes per hectare as compared to 14 tonnes per hectare in the area cultivated by small growers.

Virtually the entire output is meant for exports, domestic demand being negligible. Exports of canned pineapple products evinced an impresseive rise from 37,500 tonnes valued at $ 9.4 million in 1962 to 59,800 tonnes worth $ 14.7 million in 1966. The United Kingdom is the principal market absorbing about 30% of Malaysia's exports, but the rise in total volume was brought about mainly by increased sales to the United States and West Germany.

It must be noted, however, that the Malaysian industry has had to contend with several adverse factors, particularly during the fifties. The sharp decline in world prices resulting in accumulated stocks, inadequate capital to finance stock accumulation, unhealthy inter se competition, speculation and short selling by export agents, the absence of uniform grades requiring the product to be sold purely on grounds of price rather than quality and publicity were important among such factors. Credit for setting the industry on a sound footing must go to the Malaysian Government. Under a comprehensive ordinance issued in 1957, 'The Pineapple Industry Ordinance, 1957' (Annexure D), the Government set up the Malaysian Pineapple Industry Board (MPIB) with extensive powers to regulate and develop the pineapple industry in Malaysia. Following the Commission of Enquiry in 1959, the Government reorganised the Malaysian Pineapple Industry Board (MPIB) with a view to rationalizing production for export and export prices, regulating the marketing of raw and canned fruit and organising research into the cultivation and processing of pineapples. Further in 1964, the Government established the Pineapple Cannery of Malaya, the most modern of the four canneries in the country, mainly to process the fruit of small growers, who should be reckoned as an important factor in the industry. The setting up of the Pineapple Industry Marketing Corporation in 1966 was the most important step towards promoting and regulating the marketing of pineapple products.

Philippines. Pineapple processing industry in Philippines, which runs on the most modern lines, is essentially an extension of the operations of leading Hawaiian packers, Delmonte and Dole, of whom the latter entered the field only three years ago. Lower unit costs of land and labour and lower corporate profit tax are important among the advantages offered by Philippines, which attract these canners to this country for expanding their activities.

While yields elsewhere in the country are reported to be poor, Delmonte (known in Philippines as the Philippine Packing Corporation) and Dole, who have adequate plantations of their own, have been able to achieve higher yields as compared to even Hawaii, using the same variety, Smooth Cayenne. These companies have invested heavily in research which is paying rich dividends. It has been found that the plant takes only 17 months in Philippines for the first crop as against about 21 months in Hawaii. Further, the plant gives two ratoons in Philippines taking about 14 months for each crop, whereas the normal practice in Hawaii is to replant after the first ratoon. These companies are able to obtain a yield of over 170 tonnes per hectare over a period of 45 months, which may be compared with the range of 100-150 tonnes reported to be obtained in Hawaii, over a four-year cycle. To achieve this high yield, 2000 to 3000 lbs of fertilizers are applied over a period of six months costing about $ 35 per acre. Cost of cultivation in Philippines, reckoned at $ 13-14 per tonne, is considerably lower than in many other countries. Intensive research is carried out on a continual basis on the methods of cultivation so as to keep the operational costs to the minimum; as an instance might be cited the fact that one of the two canners is experimenting with increasing the number of pants per hectare from the present level of 62,000 to 75,000 so as to achieve a higher proportion of 2¼" size in the fresh produce, which contributes to better recovery in the processing.

More than 80% of the output is exported. Exports evinced an impressive rise from 28,500 tonnes in 1958 to 40,900 tonnes in 1965. Current exports should be more by at least another 10,000 tonnes, taking into account the operation of Dole who have entered in field with fairly large exports. One of the main objectives of the industry is to service the Eastern part of USA, the Western part being covered by Hawaii; USA has been largest market for pineapple products of Philippines. However, the industry has in recent years been able to capture appreciable shares of other markets, notably West Germany and Netherlands.

India's Position

Of the estimated production of some 80,000 tonnes of fresh pineapples in India, not more than 10% is used for processing, while the processing industry provides the most important outlet for fresh pineapples in all the major supplying countries.

According to the statistics released by the Directorate of Marketing Inspection, total output of all pineapple products amounted to 3,477 tonnes in 1965. On the basis of the data collected during the Commodity Study in India, it is possible to arrive at the following rough break-up: slices 40%; Juice 35%; jam etc. 25%. Nearly 60% of the production is concentrated in Kerala, where the canners have been able to enter into workable agreements with the growers for the supply of fresh fruit. The balance 40% of the output comes from Uttar Pradesh, Mysore, Madras, etc. Most of the production is marketed within the country, exports being limited to about 800 tonnes of juice, mainly to USSR. Defence provides a major outlet in the domestic market, absorbing about 500 tonnes of pineapple slices and 100 tonnes of pineapple jam. The balance represents domestic civilian demand.

The pineapple industry in India has a long way to go to catch up with the advanced industry in countries like USA and Philippines. The success of the industry in these countries can be attributed in the main to the vertical integration of operations, ranging from cultivation of the fresh crop to marketing of the finished product; besides, the expensive modern equipment used and the constant attention paid to research have contributed greatly to economies in the cost of production. These are advantages denied to the Indian industry because of its esentially small size. The high cost of production in India follows as a corollary. Data collected during the Survey throw up the following comparative picture of costs (relating to 1967) between India and Philippines:

Comparative Costs of Production of Slices

(Unit: one case of 24x2½)

	India Rs	Philippines* Rs (equivalent)
Fresh Pineapples	12.76	6.52
Sugar	8.28	2.62
Cans	12.36	9.52
Labees and Cartons	2.88	2.40
Utilities	1.23	0.60
Manufacturing labour	1.50	1.88
Plant and other overheads	6.73	5.40
	45.74	28.94

Even ignoring that the Philippine costs relate to the top grade of slices, 'Fancy', compared to which the Indian slices are inferior in quality, the Indian costs, it will be seen from the above table, are 58% higher than those of Philippines, which, incidentally, is not a low-cost producer by international standards. Even in respect of cans, tinplate for which has to be imported in the case of Philippines also, Indian costs are higher by 30%; the differential is much higher at 96% in respect of fresh pineapples and 216% in respect of sugar.

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*Relates to 'Fancy' grade; Indian output is not graded.

Prospects for India

Restrictions imposed on acquiring plantations of adequate size, high cost of raw materials like sugar and cans, lack of adequate resources for investment and restrictions imposed on imports of machinery and know-how are some of the major factors inhibiting growth of the processing industry in India. Unless satisfactory solutions can be found to these problems, India cannot hope to have any appreciable share in the world export trade, which has been expanding fast during recent years, because the industry is highly organised in the principal supplying countries and the competition offered by them is intense.

In the first instance, it is necessary to be able to produce the fresh fruit at economic costs, because this represents a major element in the cost of production. There is also need of raising the variety specially suitable for processing, Smooth Cayenne or some strain of it suited to local conditions, and ensuring availability of the fruit round the year, through application of hormones as being widely practised by all major suppliers in the world, so that the plant size can be kept to the minimum. Substantial investment in machinery and equipment is required to set up a modern plant for processing pineapples, plant of the minimum economic size costing at least Rs 10 million.

While production needs to be organised on efficient lines as indicated above, selling canned pineapples overseas calls for aggressive publicity and promotion. Tie-up arrangements with leading distributors abroad, under whose label the product can be offered, will be very helpful in this context; this practice is commonly followed by even established packers in certain markets. It will also be advantageous to explore the possibility of entering into suitable agreements with processors overseas, under which pineapple juice concentrate can be exported from India for reconstitution at the other end.

Considering the need for large scale investment required for setting up a modern industry and the stiff competition India, as a new entrant, will have to face in world markets, where leading suppliers are already firmly entrenched, the possibility of inviting collaboration from established overseas packers merits serious consideration. Not only access will be gained to the latest know-how, but the marketing problems also will be solved through such collaboration agreements. It is also possible to invite investment from other foreign sources. For instance, it has been found during the course of the Survey that leading financiers in West Germany are interested in developing the processing industry in other countries offering specific advantages (low wage rates etc.), which can serve as a regular sourco for meeting the growing requirements of the German Market. This needs to be pursued seriously. It may be mentioned in this context that the pineapple industry in Kenya owes its development to such German interests.

Apart from the possibility of inviting foreign investment, the Survey has revealed the definite scope that exists for securing the services of technical personnel from the French

Government under the Indo-French Technical Assistance Programme. The success achieved by France in developing a sound pineapple industry in Ivory Coast indicates the potential value of such assistance.

Taking into account the growing world demand and the various measures suggested for developing a modern pineapple industry in the country, it should be possible for India to develop an export trade of 15,000 tonnes in canned pineapples by 1975-76.

C. Recommendations

Major recommendations for the development of a modern pineapple industry in the country are listed below:

1. The proposed Fruits and Vegetables Export Corporation should organise production for export by operating through growers' cooperatives on a selective basis, to whom it should offer the necessary technical guidance and financial assistance, assuring them of a minimum price per tonne of fresh fruit.

2. Canners should be encouraged to acquire adequate plantations of their own, so that the advantages can be realized of vertical integration contributing to efficiency of operations.

3. The possibilities of inviting collaboration from established overseas packers, andof inducing leading foreign financiers to invest in the development of the processing industry in India need to be explored.

4. Another possibility that merits serious consideration is that of securing the services of technical personnel from France, under the Indo-French Technical Assistance Programme, for developing a modern pineapple industry in the country.

4.4 MANGOES

Background

Mango is the most important horticultural crop grown in India, claiming a share of over 35% of the total production of fruits and vegetables in the country, estimated at 20 million tonnes. India, which is acknowledged as the home of mangoes, is by far the largest producer of the fruit, accounting for about 80% of the total world production. World trade in mangoes, fresh as well as processed, however, is very limited. World exports of fresh mangoes can be safely placed below 10,000 tonnes; Philippines and Thailand are the leading exporters, India's share of the total exports being limited to about 10%. India, however, claims a substantial-share of 70% in world exports of mango products, which can be placed at 7,000 tonnes, as processing of the fruit is not undertaken on an appreciable scale in other supplying countries. Pickles and chutneys are traditional export items from India, exports averaging about 1,600 tonnes annually. In recent years, other mango products (mainly mango nectar) are becoming more significant in the exports of mango products from India.

Mango has to contend with severe competition in world markets from established fruits like apples, peaches, pears and strawberries on the fresh side and peaches, pineapples and pears on the processed side. But as the largest producer of the fruit, India, which has the added advantage of the reputation as a producer of high quality varieties, owes it to itself to take the lead and popularise this delicious fruit in world markets. This calls for large scale promotional effort as mango is a comparatively little known fruit in most countries of the world.

A. Fresh Mangoes

World Production

Ecological requirements. Mango is essentially a tropical crop, but it is known to grow well in certain sub-tropical climates also. The crop grows in high as well as low humid tropical regions, although it becomes susceptible to fungal attack in the latter case. The best quality of mangoes are supposed to be obtained in areas having prolonged dry seasons. The crop is known to be tolerant to wide variations in the composition of soil; however, inundation of soil appears to affect adversely the rate of bearing of the fruit.

Varieties. In India alone, there are estimated to be more than one thousand varieties of mangoes under cultivation, although only 12 are of commercial importance; these are: Alphonso, Baneshan, Suvarnarekha, Dussheri, Chausa, Langra, Pairi, Mulgoa, Fernandin, Mulcuradu, Fazli and Neelum. Quality characteristics of these and other varieties are given in the technical note at Volume II, Annexure 8. All standard varieties are raised from grafting; seedling varieties, which account for about two-thirds of the total output in the country, are not considered standard because of their monoembryonic nature.

There is no uniform nomenclature for the varieties grown in different parts of the world, the fruit being mostly known by local names. It is, however, common to distinguish three major types: Indian, Mexican and Filipino. Important varieties produced in UAR, USA (Florida) and some of the African countries are listed below:

(Next page)

UAR:	Taimour, Hindi-Sinnara, Pairi, Aromanis, Mabruka, Balady
USA (Florida):	Discochuelo, Chino, Mamey, Corazon
Mali, Malagasi, Senegal etc:	Amelie, Julie

Seasons of Harvest. The seasons for harvest for most important varieties grown in India fall between April and July, although certain late varieties, not rated as high in quality, are available upto September. Seasons of harvest of the main commercial varieties in India, together with important areas of production, are shown below:

Variety	Season	Areas of Production
Survarnarekha (Swarnarekha)	March-April	Andhra Pradesh, Madras, Orissa
Alphonso (Badam, Khader or Appos)	April to June (1st week)	Maharashtra, Gujarat, Mysore, Goa
Baneshan (Alampur Baneshan)	April-June	Andhra, Madras
Fernandin & Malcurada (Mankurad)	April-June	Goa
Dussheri	June-July	Uttar Pradesh, Punjab
Fazli	July-August	Bihar, West Bengal
Chausa (Samar-behist Chowsa)	End of June to July	Uttar Pradesh, Punjab
Neelum (Pedda Neelum)	September-October	Madras

The season for the fruit varies from country to country. In UAR, for instance, the season is from April to September, and mangoes are in fact available round the year in one or the other of the producing countries in Africa, as indicated below:

Seasons of Harvest in Selected African Countries

Country	Season
Congo Brazzaville	January - March and November-December
Malagasy	January - February and September-December
Mali	February - June
Upper Volta	March - June
Dahomey	March - May, July and December
Senegal	Mid-May to Mid-August
Togo	March - May, July and December

Yields. Average yield in India has been estimated at 9.3 tonnes per hectare in 1961-62. The estimates for UAR and Philippines, relating to 1966, are 11.3 tonnes and 0.9 tonnes per hectare, respectively. It is, however, difficult to draw serious inferences from the average yield, as the crop is not always raised on a plantation basis and estimates of production necessarily include the yield from stray trees scattered all over. The yields will be much higher than indicated by these averages, if only commercial production is taken into account. As far as the African countries are concerned, it is estimated that from the sixth year of the planting onwards the tree yields about 10 tonnes per hectare rising to about 20 tonnes by the tenth year.

Production. Data on world production of mangoes are extremely scanty. Even in the case of India, the latest estimates relate to 1961-62. The Directorate of Marketing and Inspection (Nagpur) has estimated, on the basis of a Survey, total area under cultivation of mango at 748,000 hectares and total production at 7.0 million tonnes in 1961-62. Current production in India will probably be close to 7.5 million tonnes. In the absence of official statistics, production of Pakistan, which is known to be a major producer of mangoes, can be placed at a minimum of one million tonnes. Official statistics of Philippines show that production of mangoes went up from 95,000 tonnes in 1964 to 131,500 tonnes in 1966. The latest estimate for UAR relating to 1966 is 88,000 tonnes. Thailand, South Africa, Brazil, Mexico, Cuba and USA (Florida) are known to be other major producers of mangoes, but statistics of production are not available.

Mangoes are grown in varying quantities in different countries in Africa, ranging from an estimated 20 tonnes in Gabon to 75,000 tonnes in Mali; total production of Africa, excluding South Africa and UAR, has been estimated at 154,000 tonnes.1/ Assuming the current Indian production to be 7.5 million tonnes and allowing another 2 million tonnes for the production of all the other countries put together, world production of mangoes may be reckoned at 9.5 million tonnes.

World Trade

Data on world trade in mangoes are difficult to obtain because mangoes are clubbed with other tropical fruits in the foreign trade statistics of most countries.

1/ la Promotion Commerciale des Fruits Tropicaux sur le CEE, Rapport General, Brussels (1967)

It is, however, known that Philippines and Thailand are the largest exporters of mangoes, accounting for 3,243 tonnes and 2,246 tonnes respectively in 1966. While exports of Philippines are directed almost exclusively to Hong Kong, practically the only outlets for exports of Thailand are Singapore and Malaysia. India comes next in importance with exports of 1,072 tonnes in 1967-68. About 80% of India's exports are absorbed by Kuwait, Bahrain and Trucial Oman States; and limited quantities of about 80 tonnes are exported to UK.

UK and France are the leading consumers of fresh mangoes in Europe, with estimated imports of 250 tonnes and 160 tonnes respectively. Netherlands is important among other European countries, estimated to be importing about 50 tonnes annually. Data in respect of Northern and Latin American countries are not available. But it would appear that world trade in fresh mangoes does not exceed 10,000 tonnes.

Prices

The average export prices of different suppliers vary considerably as will be clear from the following:

Country	Average F.O.B. Price ($ per Tonne)
UAR	390
Philippines	180
India	225
Thailand	108

It is commonly acknowledged that Indian mangoes are superior in quality, although this is not reflected in the average price realised. But for this, the above prices are to a large extent indicative of the differences in quality. It should be noted, however, that trade in fresh mangoes is mostly confined to countries in the immediate vicinity. For instance, as mentioned above, virtually the entire exports of Thailand go to Singapore and Malaysia representing the total imports of mangoes into these countries. The same one-to-one relationship exists between Philippines and Hong Kong. Exports of UAR are largely confined to neighbouring countries like Jordan and Syria. On the other hand, the European countries, particularly UK and France, obtain their supplies from a large number of countries. Average c.i.f. prices during 1967 in selected Survey countries were as follows:

Country	Average c.i.f. price ($ per tonne)
UK	600
France	772
West Germany	800
Belgium	850
Kuwait	260

The substantial difference between Kuwait and other countries in c.i.f. prices is explained by the fact that Kuwait obtains its supplies (from India) by sea, whereas exports to the European countries are mostly effected by air, which adds to the costs.

Prospects for India

Although there is a substantial production-base in the country, an estimated production of some 7.5 million tonnes, exports of mangoes from India have been relatively insignificant. It is rather paradoxical that while accounting for over 80% of the world output, India's share in exports of fresh mangoes is limited to only 10%. This is largely because other major producing countries, particularly Thailand and Philippines, enjoy considerable advantage of geographical proximity to the main consuming markets. India also has exploited the similar advantage it has with respect to the Gulf countries.

Mango has not yet become popular in the European countries; in fact, they are hardly known in most European markets, with the exception of UK and France. Indications, however, are that the potential is immense. According to a recent Survey[2] of the European Economic Commission, demand is likely to rise to the level of 50,000 tonnes in the next few years. The production base in African countries like Mali, Congo and Senegal is limited and will continue to remain so despite the scope that exists for expansion of production. It follows that India can hope to secure a sizeable share of this potential demand, given adequate effort.

The strategy for developing a stable export trade in fresh mangoes will have to differ from region to region. As far as markets in South East Asia are concerned, which are the largest consumers of the fruit at present, India, notwithstanding its disadvantages in terms of geographical

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2/ la Promotion Commerciale des Fruits Tropicaux sur le CEE, op. cit.

distance vis-a-vis other competitors, can still hope to secure a sizeable share of the market by virtue of the acknowledged superiority of Indian mangoes in respect of quality. The large number of people of Indian origin in Singapore and Malaysia provide an ideal opportunity for India to expand its exports to this region. In fact, a few attempts have been made in the past to secure regular supplies of mangoes from India, but the experience of importers has been quite disappointing. Lack of a fast shipping service between India and these countries, coupled with poor attention paid to handling the fruit, has resulted in substantial damages to the fruit in - transit. Discussions with importers in Singapore and Malaysia have revealed that if satisfactory transport facilities are provided ensuring safety of the fruit in transit, there is scope for building up a sizeable export trade with these countries. It is, however, to be noted that the low prices at which Thai mangoes are offered to these countries (about $ 120 per tonne, c.i.f.) will be a serious factor to reckon with. While a premium can be expected for the Indian mangoes on grounds of quality, it is doubtful whether any sizeable shipments can expected at rates higher than $ 180 (c.i.f.) per tonne. While the ability to offer comparable prices will be a major factor determining India's long term prospects, the provision of adequate transport facilities by itself is expected to contribute considerably to increase in exports.

As regards the Gulf area, there has been considerable expansion of exports, shipments rising from 414 tonnes in 1965-66 to 907 tonnes in 1967-68. Of these, exports to Kuwait registered an impressive rise from 224 tonnes to

614 tonnes and those to Bahrain increased from 102 tonnes to 207 tonnes over the two years. It may be mentioned that the considerable volume of trade in bananas which India has been able to build up in this region has contributed significantly to this rise in exports. It is common for the boat chartered for bananas to carry mangoes also during the season. However, this is not a sound practice isasmuch as the optimum temperature required for mangoes is less than with usual 55°F maintained for the purpose of bananas, with the result that considerable quantities of mangoes are spoiled during transit. It will, therefore, be advisable for the Shipping Corporation of India, as elsewhere recommended in this Report, to acquire and ply a fast moving boat of about 1,000 tonnes capacity, half of it being reserved for refrigerated cargo, with separate hauls for different kinds of fruits and vegetables. This will facilitate increased exports of not only mangoes, but a large number of other fruits and vegetables to the Gulf region.

The strategy for exports to the European countries will, however, have to be different. The fruit has come to be regarded as a luxury in most of the markets and consumers are prepared to pay a premium price as such. The common preference is to obtain supplies by air so as to ensure freshness of the fruit. A substantial proportion of the total imports of mangoes into the European markets is effected on this basis. Discussions with importers in UK have revealed that the acceptable price would be about $ 0.60 per kg, c.i.f., London by air. This, however, appears to be a difficult proposition considering the substantial air freight between India and UK, which alone comes to as $ 0.45 per kg. Nonetheless, if an organised effort is made to procure the fruit at economic prices and develop exports, through an organisation such as the proposed Fruits and Vegetables Export Corporation, it should be possible to offer the fruit at acceptable prices.

The following considerations will have to be taken into account in regard to exports of mangoes to the European markets:

i) Quality of the fruit is of course of prime consideration. A bright yellow colour is generally preferred in most European markets. The fruit should be perfectly graded by size and appearance. Four or five fruit to a kg will be generally acceptable.

ii) Special care will have to be taken in regard to packing. The fruit should be individually wrapped in tissue paper and packed in cardboard cartons; 12 fruit to a carton will be preferred.

iii) Mangoes being a comparatively little known fruit in the European markets, adequate publicity and promotion is called for to build up a sizeable export trade. Small pamphlets explaining how to cut and serve the fruit and recipes for preparing icecream, fruit salads, etc., with mangoes may be forwarded along with each carton shipped. In fact, exporters in cargo, attach a small pamphlet of this type to each individual fruit with a rubber band.

iv) Proper arrangements for marketing of the fruit are of great significance in exports of fresh fruit to the European countries; trade in these markets is usually controlled by a handful of businessmen. Proper tie-up arrangements will have to be made with leading importers, selected speciality stores, etc. Specific interest in Indian mangoes was evinced by certain leading commission agents mentioned in Chapter 3-6 of the Report.

v) Although Alphonso is the best known Indian variety outside India, the choice can by no means be considered limited to this. Efforts should be made through consumer surveys in UK, France, West Germany, Netherlands and Belgium to ascertain the consumer preference as between different varieties of mangoes available in India. Dussehri, for instance, has a bright yellow appearance and rich flavour, and the fruit is small in size, which is a desirable characteristic in many markets. Similarly, Chausa has a characteristic, distinctly strong flavour, which may gain acceptance in some of the markets, despite the fact that the fruit does not develop a pure yellow skin colour, even when fully ripe.

vi) Seasonal advantage is a main plank on which a sizeable export trade can be built in mangoes. From the middle of May onwards there will be plentiful supplies of other fruits like apricots, strawberries and peaches in most European markets, offering a strong competition to mangoes. Early supplies being a clear advantage, horticultural research may be undertaken aimed at advancing the harvesting season of some of the choice varieties like Dussehri and Chausa, which are not early varieties at present.

It is envisaged that through an organised effort it will be possible to build up export trade of the order of 10,000 tonnes by 1975-76, of which the European markets should be able to absorb at least 5,000 tonnes.

B. Mango Products

Processed mango products can be broadly divided into five groups: a) slices in syrup; b) juice/nectar; c) pulp; d) jam; e) pickles and chutneys. Of these, only mango slices in syrup and mango nectar are to some extent produced by other supplying countries, the remaining being largely confined to India.

World Production

According to the statistics compiled by the Directorate of Marketing and Inspection (Nagpur), the total output of mango products (all kinds) amounted to 11,317 tonnes in 1966. Data on production in other supplying countries are extremely scarce; it is, however, known that the quantities involved are not significant. It has been found during the course of the Survey that Thailand produces about 300 tonnes mango slices, juice etc. Official statistics show that Philippines exported 145 tonnes of mango slices in syrup during 1966. On the basis of discussions held with the leading canners in UAR, it has been estimated that production of mango slices and nectar in UAR is currently of the order of 2,000 tonnes.

On the basis of the above indications, production of mango products in countries other than India could perhaps be placed in the neighbourhood of 3,000 tonnes, thus making for a total of about 15,000 tonnes as the world output.

World Trade

World trade in processed mango products is dominated by India. Mango pickles and chutneys represent traditional export items from India, exports averaging about 1,600 tonnes during recent years. Exports of these items are mainly directed to UK. During the past few years, however, mango nectar has replaced pickles and chutneys, the leading item of exports. Shipments of mango nectar rose from 1,315 tonnes in 1965-66 to 3,338 tonnes during 1967-68, bulk of the exports being absorbed by USSR and Kuwait. Exports of mango slices in syrup are much less in comparison, scarcely amounting to 150 tonnes a year at present. Mango pulp, mango jam etc. are much less significant, total exports of these items being less than 100 tonnes. Total exports of mango products from India amounted to 4,900 tonnes in 1966-67.

As mentioned above, Philippines exports about 145 tonnes of mango slices in syrup. Exports of UAR comprise about 1,000 tonnes of mango nectar and 500 tonnes of mango slices in syrup. Data on exports of other countries are not available, but total world trade in mango products is unlikely to exceed 7,000 tonnes.

Prospects for India

Mango Slices in syrup. Successful trade in canned mango slices depends heavily on the industry's ability to offer the product at preces competitive to these of established canned fruits like peaches and pineapples. These fruits are offered in most markets between $ 4 and $ 6 (c.i.f.) per standard case, whereas most Indian quotations for mango slices range upwards of $ 8 a case. Although a slight premium is attached to mangoes as an exotic fruit in the European markets, a price differential of this magnitude cannot but be regarded as a serious handicap to increased exports of mango slices. In the South East Asian and Gulf countries, however, where mango as a fresh fruit is fairly well-known, the prospects appear to be relatively better. The Survey has revealed that appreciable scope exists for augmenting the exports of canned mango slices to Singapore and Malaysia, through tie-up arrangements with suitable agents in these countries. Specific enquiries received during the course of the Survey have been forwarded to the Indian trade.

Mango Juice/Nectar. Sucess achieved by India in developing a stable export trade in mango nectar with USSR and Kuwait is impressive. Over the past four years, India has been able to capture a 50% share of the market for mango nectar in Kuwait; the credit for developing the market in the initial stages goes to UAR, which remains a major competitor to India in this market. The success achieved by India can be attributed mainly to the superior flavour of the product and the competitive prices at which it is offered. Indian mango nectar is offered at about $ 3.60 per carton (48x170 gm), which is about 20% lower compared to the Egyptian prices. It must, however, be mentioned that inferior quality mango nectars being offered by some 'fair weather' exporters from India pose a definite threat to India's prospects in this field. This calls for the formulation and strict enforcement of rigid quality standards for the product at home.

Considerable scope is envisaged for mango nectar in the South East Asian and European markets, provided adequate promotional effort is undertaken. Requirements of individual markets will, however, have to be carefully taken into account.

For instance, in France and West Germany, if the product is offered as mango juice, no dilution of it will be allowed as the import regulations require that all juices be pure and natural. The preference in most European markets would, however, be for mango nectar and not mango juice which is too viscous for the European taste. Nectar of 20-25% strength would be acceptable in these markets. In contrast, importers in Kuwait have deprecated the description of the product on certain Indian exporters as mango nectar--which it is--and strongly suggested that it should be offered as mango juice. This is in line with the Kuwaiti taste for thick juices: the thicker the juice, the better it is considered by the consumer. In fact, a major factor in favour of the Egyptian nectar is its higher juice content.

Mango Pulp. This represents an item having considerable export potential. The Survey has revealed that definite scope exists for exporting sizeable quantities of mango pulp to processors in other countries for use in the manufacture of jams and ready-to-sell beverages. The product can be conveniently offered in 5-kg tins like apricot and peach pulps, which are established in this trade. Specific enquiries received in Singapore and Yugoslavia have been forwarded to India trade.

Mango Pickles and Chutneys. India has been exporting considerable quantities of pickles and chutneys, exports averaging 1,600 tonnes during the past three years. UK has been traditionally the largest market for Indian pickles and chutneys. Exports to UK take place mostly in bulk, the product being re-packed and marketed under distributors' lebels. While most of the imported pickles and chutneys are consumed within UK, limited quantities are re-exported from UK to certain West European countries. It would appear on the basis of the Survey that by establishing direct contacts with re-packers in these countries on similar lines, India can increase its exports of pickles and chutneys to an appriciable extent. Although to the extent represented by re-exports from UK, there would be a decline in the offtake of UK, a net expansion in export from India is envisaged.

Iraq used to be the second largest importer of Indian pickles and chutneys until recently. However, rigid import restrictions in that country during the past few years have closed an important outlet for Indian pickles and chutneys. It has, however, been found during the course of the Survey that definite possibilities exit for export of raw mango slices in brine from which the finished product can be manufactured in Iraq. Processors in Iraq have evinced keen interest in entering into 'franchise' agreement with a particular Indian manufacturer, whose brand is highly respected in Iraq. Under such an agreement, supplies of the raw slices in brine would be procured from this party, production of pickles and chutneys would be undertaken in Iraq according to the formula to be provided by the Indian party, and the product will be marketed under the Indian label, which has become very popular in Iraq over years. The Iraqi processors are prepared to enter into the long term contracts with this particular party, ensuring an acceptable royality, but insist on exclusive rights being granted to them for export of the product to the entire Arab area. As a matter of official policy, exports of raw mango slices in brine are normally not encouraged by India, but this offer merits consideration as it stands on a different footing. With the full emergence of the Arab common market in the next few years. India will have to face high protective tariffs in most Arab countries; this is a factor well worth taking into account in this countext.

On the basis of the Survey, the following targets are suggested for 1970-71 and 1975-76:

	1970-71 (Tonnes)	1975-76 (Tonnes)
Mango slices in syrup	500	10,000
Mango juice/nectar	8,000	20,000
Mango pulp	500	5,000
Mango jam	250	1,000

C. Recommendations

Major recommendations made above for increased exports of mangoes, fresh and processed, are summarised below:

1) The Proposed Fruits and Vegetables Export Corporation should organise procurement of mangoes at economic prices so that the fruit can be offered at competitive prices.

ii) Provision of adequate shipping facilities is essential for stepping up exports of mangoes to South East Asian and West Asian countries. Exports to European countries will have to be effected by air, at least in the initial stages.

iii) Efforts should be made through consumer surveys in major European markets, particularly UK, France, West Germany, Netherlands and Belgium, to ascertain consumer preferences as between different varieties of mangoes available in India, instead of considering the choice limited to Alphonso.

iv) Tie-up arrangements with leading importers, particularly with buying co-operative associations, consumer cooperative socities, international voluntary chains and speciality stores (Delicatessan) in the European countries, should constitute the main basis of strategy for developing exports of mangoes and mango products.

v) Mango being a comparatively little known fruit in most European markets, large scale promotional effort is called for.Pamphlets explaining how the fruit should be cut and served, recipes for using in fruit in icecreams, fruit salads etc. should be sent with each carton; advertisement in trade journals will help promote exports considerably.

4.5 GRAPES

A. Table Grapes

World Production

World grape crop during 1965-66 was estimated at 53 million tonnes, of which table grapes accounted for 6 million tonnes. The principal producers of grapes include Italy, France, USA, Spain, Portugal, Greece, Bulgaria, Yugoslavia, Algeria, Turkey and USSR. Annexure E-1 gives area under and production of grapes in principal producing countries during 1963-64 to 1965-66.

Wine remains the main outlet for the harvest, not withstanding the campaign to promote juice consumption in the world markets. Fresh grape consumption, however, is of the order of about 5 million tonnes per annum or 10 per cent of the total grape production.

World exports of table grapes registered substantial increase from 563,000 tonnes in 1960 to 940,000 tonnes in 1965. Main suppliers of table grapes include Bulgaria, Italy, Spain, France, Greece, Hungary, Romania, South Africa and USA. European countries, despite considerable local production account for over 70 per cent of the total world imports, though most of it comprise intra-European trade. Outside Europe, main importing countries are USA, Canada, Hong Kong, Singapore and Philippines. Statistics relating to countrywise exports and imports of table grapes during 1963-65 are provided at Annexures E-2 and E-3.

Production in Survey Countries

Production of table grapes in Survey countries at 1.6 million tonnes in 1966 approximately accounts for 25%

of the world output. Italy is by far the largest producer in Europe, followed by France, Yugoslavia, Greece and Spain, as evident from the table given below[1]:

Production of Table Grapes in major countries

(Thousand Tonnes)

Country	1964	1965	1966
Italy	792.8	828.0	858.2
France	267.0	306.1	330.0
Greece	194.6	207.0	139.1
Spain	52.0	85.0	110.0
Yugoslavia	17.0	84.0	76.0
Belgium/Luxemburg	11.5	12.0	12.0
UK	10.5	15.9	10.5
Netherlands	6.2	6.0	5.2
Sweden	1.2	N.A.	N.A.
West Germany	0.4	N.A.	N.A.
Denmark	0.2	0.2	0.2

Varieties. Out of the 30 varieties of table grapes under cultivation in Italy, Regina o Mennavacca B, Italia o Ideal, Baresana o Turchsca and Cardinal account for 70% of total production. Varieties like Regina dei Vigneti, Pense Precoce and Primus are the other notable varieties, with their share in the total production amounting to 13 per cent. Distribution of production by varieties in Italy during 1963 to 1966 is given at Annexure E-4.

1/ Basic Statistics on Fresh Fruits and Vegetables of Survey countries, Volume III, Table A-1, of the Report

In Spain, winter grapes such as Ohanes and Aledo are important both from production and export point of view. Varieties of table grapes cultivated in France include Chasselas, Gros Vert, Muscat de Hamburg, Alphonse Lavella, Olivetti, Italy and Perles d' Czabha. Rosaki and Sultana are the principal table varieties cultivated in Greece. Smerdevka is the most important variety grown in Yugoslavia.

Yields. The average yield per hectare ranges from 10 tonnes to 17 tonnes in Italy, 12 to 15 tonnes in Spain, 10 to 12 tonnes in France and 9 to 10 tonnes in Greece.

Seasons of Harvest. Main season of harvest of table grapes in Europe extends from July to October and gradually tapers off by December. Extent of concentration of production of European crop during this period can be gauged from the data given below in respect of Italy[2].

Seasons of Production of Table Grapes in Italy

Varieties	Seasons of harvest	Production(1966) (Thousand Tonnes)	% to total production
Primus	July-Early August	24	2.8
Pense Precose	Early July-August	46	5.3
Regina divigneti	Mid-July-Early September	44	5.1
Cardinal	Mid-July-August	35	4.9
Chassalas	Mid-July-Early September	14	1.7
Muscato T.	August-Early September	13	1.5
Regina	Early-August-October	479	55.9

(Contd. next page)

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[2] Instituto per le Ricevche e le Informazioni di Mercato e la Valorizzazione della Produzione Agricola, Rome (IRVAM, Rome)

Varieties	Seasons of harvest	Production(1966) (Thousand Tonnes)	% to total production
Italia	September-Mid October	76	8.9
Regina Nera	Early September-Early December	8	0.9.
Sachiaya	September-November	neg.	neg.
Others		119	13.9
	Total	858	100.0

Well over 70 per cent of the Italian production is concentrated in the months of August to October, with supplies arriving in small quantities in July, November and December. This ratio of distribution of the crop can be taken to represent broadly the pattern obtaining in other producing countries of Europe as well. Efforts to develop early and late varieties to prolong the marketing season have met with limited success. In Spain, however, winter grapes, which account for bulk of its production, are harvested during November to February as also the grapes produced in hot houses in Belgium and Holland.

With the local season, in the main, being confined to July-November, Europe obtains its supplies from outside sources during rest of the year. South Africa and USA having their main production during January-April and October-January respectively, have built up a sizeable export trade in Europe during this period, taking advantage of the local off-season.

World Trade

While the statistics relating to destinationwise exports of table grapes from the Survey countries are provided at Volume III, Table A-3, the following table indicates their total annual exports during 1964 to 1966.

(Next page)

Exports of Table Grapes from Survey Countries

(Thousand Tonnes)

Country	1964	1965	1966
Italy	213.3	215.8	240.1
Spain	102.0	102.9	83.9
France	28.6	40.6	51.8
Yugoslavia	16.6	15.3	N.A.
Greece	14.4	27.2	18.9
West Germany	3.2	2.3	N.A.
Belgium/Luxemburg	2.6	2.3	2.5
Lebanon	1.5	2.5	N.A.
Netherlands	1.2	1.4	1.3
UK	0.7	0.9	N.A.
Sweden	0.7	0.3	1.5
Switzerland	neg.	neg.	neg.
Total World Exports	732.6	940.1	N.A.

Italy, Spain and France constitute the major exporters of table grapes in Europe, with their share amounting to about 50 per cent of world exports. Greece and Yugoslavia are the other countries of importance. Bulk of their exports, however, is directed to countries within Europe, covering fully the market demand during the main crop season (July-November). Outside Europe, their export trade is nominal and hardly amounts to 10% of their total exports, as will be evident from the directional movement of exports of Italy, France and Spain indicated in the following table[3]:

(Next page)

3/ IRVAM, Italy

Direction of Exports of Grapes from Italy, France and Spain

(Thousand Tonnes)

Exporting Countries/ Importing Countries	ECM Countries	EFTA Countries	Others	Total
Italy				
1964	163.8	26.7	22.9	213.4
1965	166.7	27.6	21.5	215.8
1966	178.6	32.4	29.2	240.2
France				
1964	18.6	9.6	0.4	28.6
1965	27.8	12.6	0.7	41.1
1966	35.6	15.5	0.8	51.9
Spain				
1964	49.3	41.4	10.5	101.2
1965	45.4	46.0	11.5	102.9
1966	33.4	40.7	9.8	83.9

Bulgaria, Romania, Hungary and USSR constitute big producers of grapes though their exports are largely confined to other East European countries. In recent years, however, Bulgaria and Hungary have succeeded in stepping up their exports to West European markets, especially West Germany and Switzerland.

Export Projections. The projected export availabilities of table grapes by 1970, as estimated by OECD Working Party on Fruits and Vegetables,[4] in respect of six major supplying countries are as follows:

(Next page)

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[4] Present Situation and 1970 Prospects, Production of Fruits and Vegetables in OECD Member Countries, OECD, Paris, 1966

Projected Export Supplies by 1970

(Thousand Tonnes)

	Projected 1970 Production	Highest actual export levels in 1965 or 1966	Projected 1970 export supplies
Italy	1,250	240	325
France	350	52	60
Spain	370	103	150
Greece	180	27	27
Yugoslavia	300	15	15
Bulgaria	350	260	245
Romania	170	60	55
Total	2,970	757	877

The total supplies of 877,000 tonnes projected for 1970 refers to European crop season and does not include off-season market supplies, details of which are discussed subsequently.

Market for Table Grapes in Survey Countries

Import of table grapes into Survey countries during 1964-66 are detailed below[5]:

(Thousand Tonnes

Country	1964	1965	1966
West Germany	234	258	244
UK	60	63	68
Switzerland	32	36	34
Sweden	23	27	23
Belgium-Luxemburg	15	18	21
Denmark	10	10	10

(Contd. next page)

5/ Basic Statistics on Fresh Fruits and Vegetables of Survey Countries, Volume III, Table-A-3, of the Report

Country	1964	1965	1966
France	9	6	5
Hong Kong	4	5	7
Lebanon	3	5	2
Philippines	3	2	NA
Singapore/ Malaysia	3	2	1
Italy	1	2	2

It may be seen that in Europe, West Germany constitutes the largest market for grapes with an annual average off-take of 245,000 tonnes ($ 45 million) in recent years. With an annual import level of 64,000 tonnes ($ 26 million), UK ranks as the next largest importer. Sweden, Switzerland and Belgium/Luxemburg are the other important importers. In the South East Asian Survey countries, annual imports on the average ranged between 2,000 and 5,000 tonnes.

Sources of Supply. About 85% of total imports into Europe are effected during the 'season' by Italy, Greece and France providing bulk of the supplies. Off-season (January-May) imports, amounting to about 50,000 tonnes, originate mainly from Spain, South Africa and USA.

Singapore obtains table grapes supplies mainly from Spain, USA, Australia and to a smaller extent from South Africa. Imports into Hong Kong are derived mainly from China (Mainland). Kuwait is supplied by Iran, Jordan and Lebanon, Philippines market is fully covered by USA.

Off-season Market. UK and West Germany represent the principal off-season importers in Europe. While detailed source-wise imports of UK and West Germany are given in

Annexure E-5, seasonal and off-seasonal imports of these countries have been estimated as follows[6]:

Season and Off-season Imports of Grapes into UK and West Germany (1965-66)

(Thousand Tonnes)

	Total	Season	Off-season
UK	67.7	42.7	25.0
West Germany	244.0	234.0	10.0

Prices

Average wholesale prices (importers selling prices) for table grapes of different origins in UK and West German markets during 1966-67 are given below[7].

Wholesale Prices for Table Grapes in UK(Covent Garden)

(Shillings/Kg)

Supplying Country/ Variety	Unit	1966 December	1967 January	February	March	April	May
Spain							
Almera	11 lbs Tray	14-17	15-21	-	-	-	-
USA, California							
Red Emperor	22 lb box	40-45	36-42	-	-	-	-
South Africa							
Queen of the Vine	10 lb box	26-33	25-27	-	-	-	-
Alphonso							
Lavalle	"	-	-	24-25	22-24	-	-
Olivetti	"	-	-	26-27	-	-	-
Waltham Cross	"	-	-	30-32	20-21	20-22	
Barlinca	"	-	-	-	20-21	20-24	21-22
New Cross	"	-	-	-	-	17-18	27-28
Golden Hill	"	-	-	-	-	28-30	23-24
Almeria	"	-	-	-	-	28-30	22-23

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[6] Field Survey

[7] Ibid

Wholesale Prices for Table Grapes in West Germany (Hamburg) 1967-68

(DM per kg)

Supplying Country/ Variety	1967						1968	
	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb
Italy								
Regina	1.5	0.80	0.75	1.20	-	-	-	-
Spain								
Rosetti	-	1.15	0.80	-	-	-	-	-
Chanes	-	-	-	1.3	1.2	1.5	1.2	1.2
South Africa								
Waltham Gross	-	-	-	-	-	-	-	2.95
Alphones Lavelle	-	-	-	-	-	-	-	2.25

It will be seen that off-season prices are twice those obtained during the main crop season.

India's position

Commercial grape production in India has assumed importance only in recent years and the total area under this crop was estimated at 2,300 hectares and production at 44,350 tonnes in 1963. Maharashtra, Andhra Pradesh, Madras, Mysore, Punjab and Haryana constitute the major grape producing states in the country. Outside these States, grape production is nominal and has yet to attain commercial status. In 1965-66, production of grapes in Maharashtra and Mysore alone was estimated at 50,000 tonnes each and in Andhra Pradesh at 20,000 tonnes.

Principal varieties of grapes cultivated in India include Bokhri or Pachadrkshai, Khandari, Thomson seedless, Gulabi (similar to Muscat), Selection 7, Bangalore purple, Anab-e-shahi, Pusa seedless, etc.

Anab-e-shahi, Gulabi and Selection 7 are choice table varieties, while Thompson seedless and Pusa seedless are suitable for canning purposes and Bangalore purple, Bangalore blues and Bhokri are good for wine-making. Details of varietal characteristics are given at Volume II, Table A-9.

Impetus to the increasing trend in grape cultivation in India has stemmed mainly from the fact that higher yields could be obtained from the crop and that there is possibility of staggering the harvest round the year through appropriate pruning process. As stated earlier, grape harvests in major producing countries are strictly seasonal with supplies, in the main, confining to July-October. India on the other hand has its principal harvests during December-May with possibility of securing supplies in other months of the year. Such a complementarity in the seasons of production provides an excellent opportunity to India to develop exports of table grapes to European markets during their off-seasons. Besides, India can also develop market for canned Thompson seedless grapes which fetches premium prices in the sophisticated markets of the West.

There is hardly any export of table grapes from India at present. The few small consignments, intermittently sent to Singapore, Kuwait and other neighbouring markets do not amount to more than 30 tonnes per annum.

Prospects for India

The total market requirements of table grapes in the Survey countries aggregated to 417,000 tonnes in 1966. The Survey has shown that this includes an off-season market for table grapes in Europe during December-May period, of the order of 50,000 tonnes per annum. The major share of this market is presently held by South Africa. Main importing countries during the off-season include UK (20,000 tonnes) and West Germany (5,000 tonnes). The Survey has also revealed that the demand potential for quality grapes would be of a sizeable order in the years to come especially for those varieties which are presently marketed in Europe.

India can secure a sizeable share in the European market if necessary steps are taken for meeting the foreign market requirements in respect of quality, grade standards (OECD Standards)[8], packaging (OECD Specifications)[8], delivery schedules and prices. South Africa presently offers grapes during off-season at an average c.i.f. price of $ 0.25 to $ 0.30 per kg. On the basis of the Survey it is envisaged that the exports of Indian table grapes could reach the level of 1,500 tonnes by 1975-76.

B. Processed Grapes

Out of a total average world grape production of 53 million tonnes, 90% is utilised for processing purposes, mainly for the manufacture of wines. The wine industry is highly specialised in terms of techniques of production and marketing in the major grape growing countries of Europe. Against the background of an average annual production of 50,000 tonnes and the existing prospects of cultivating grape varieties suitable for wine-making, India's performance in the development of a viable wine industry has been unimpressive so far, commercial production of wines having

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8/ Standards and Regulations on Fruits and Vegetables Industry of Survey Countries, Volume V, Chapter I been started only recently for domestic consumption. Though the scope of the present Survey did not cover wines, it is believed that adequate potential exists for the exports of wines to Europe as well as other world markets. In view of the importance of this industry in the international trade, it is considered essential to make a proper assessment of the possibilities of developing an export oriented wine industry in the country.

Canned grapes are high priced processed items having a good market potential in the world. Thompson seedless variety is considered to be suitable for the manufacture of canned grapes. This variety is presently grown in India in certain parts of Mysore and Maharashtra. The Survey revealed that there is a substantial trade of canned grapes in European markets, those emanating from South Africa, France, Italy and Spain being quoted at $ 14 - 15 per carton of 48x15 oz. Having regard to India's ability to produce Thompson seedless variety and the profitable trade that exists for canned grapes in the world markets, it is envisaged that India should be in a position to export approximately 1,000 tonnes of canned grapes by 1975-76.

C. Recommendations

The Survey has indicated that adequate possibilities exist for the sale of Indian table grapes in fresh as well as processed form. However, with a view to achieving the export targets envisaged for 1970-71 and 1975-76, certain steps need to be initiated. There are three categories of problems which need to be tackled on an immediate basis. They include i) identification of suitable varieties from among those grown presently in the country which are likely to find favour with the overseas consumers, ii) identification of varieties being marketed presently in Europe and cultivation of the same in India, and iii) arrangements for efficient procurement, grading, packing, transport and marketing of table grapes in overseas markets. For overcoming these problems and exploiting immediate potential available in certain Survey countries, the following measures are suggested:

1. A few trial consignments of choice Indian varieties including Anab-e-Shahi and Gulabi may be sent to UK and West Germany for ascertaining the trade as well as consumer reaction to their suitability. The Indian Agricultural Research Institute, New Delhi is also seized of the problem of selection and introduction of European varieties in the country. It needs to be ensured that the varieties selected conform to those marketed presently in Europe and harvested during December-May period.

2. Among the countries surveyed in South East Asia and West Asia, Singapore offers immediate export prospects for Indian grapes. The annual average imports of Singapore are around 2,200 tonnes, coming mainly from Spain and USA. Trade discussions held during the Survey indicated that Singapore importers would be willing to secure supplies from India provided the prices are competitive. It is believed that varieties like Anab-e-Shahi and Gulabi would be acceptable in the Singapore market. The acceptable c.i.f. price is likely to be about $ 0.50 per kg. Pending the establishment of the proposed Fruits and Vegetables Corporation, the initial trial shipments to Singapore may be made by the State Trading Corporation of India for market exploration.

3. An integrated development programme on the basis of a feasibility study covering different aspects including selection of suitable varieties, identification of areas for development, arrangements for the procurement of grapes and developing large farms on corporate/cooperative basis should be formulated for expanding exports.

4. An integrated programme for the development of a canned grape and wine industry in India should be formulated on the basis of a feasibility study to be undertaken for the following:

   i) identification and selection of varieties suitable for canning and wine-making purposes;

   ii) selection of areas most suitable for the growth of these varieties;

   iii) determination of the number of processing units to be set up in ideal locations;

   iv) arrangements for the procurement of quality grapes for processing purposes.

5. In view of the substantial potential that exists for wines and canned grapes in the European market, it is suggested that a detailed consumer survey should be undertaken in Europe for studying the market potential for these products.

4.6 LYCHEES

Background

Lychee (Litchie chinensis) is a delicate fruit with hard scaly outer covering, rather like plastic film, yellowish red to red in colour and a small hard seed surrounded by white aromatic flesh which constitutes the edible part of the fruit and tastes like muscatal grapes. Besides consumption in fresh form of lychee wholes and lychee juice.

A. Fresh Lychees

World Production and Trade

Though lychees are cultivated mainly in hot and humid climate of the Far East (particularly in Mainland China), recently a few other countries like West Indies, Malagasy and South Africa have taken to its cultivation. Details of production of lychees in various producing countries are not available. Mainland China is reported to be the largest producer of lychees in the world, followed by India which ranks second in world production. It is understood that current production in Malagasy is around 500 tonnes per annum. Some quantities of lychees, emanating mainly from South Africa and Malagasy enter the international trade, statistics on which are not available.

Varieties and Seasons of Harvest. Information on varieties grown in Mainland China, South Africa and Malagasy is not available. Desi sahi and Badana constitute the early varieties of lychees extensively cultivated in Bihar. Purbi and China are the popular late varieties in India. While early varieties come to harvest during April to May, the late varieties yield fruits during May to June in India. Production in Malagasy extends from November to February and South African supplies are limited to December - January.

Yields. The yield in Malagasy is around 500 kg per hectare. Though the yield in India varies from place to place, it averages at 5 tonnes per hectare.

India's Position

Due to exacting soil and climatic requirements, cultivation of lychees in India is localised in Muzafarpur in Bihar, Murshidabad in West Bengal and Dehradun and Nainital in Uttar Pradesh. Bihar accounts for over 80% of the total Indian production of over 400,000 tonnes in 1967-68. Distribution of area and production of this crop (1967) in Bihar was as follows:[1]

District	Area (Hectares)	Production ('000 Tonnes)
Muzafarpur	18,425	276.3
Champaran	6,250	93.8
Dharbanga	4,680	70.2
Others	6,182	94.6
Total	35,537	334.9

Prospects for India

Lychees are imported into European markets in small quantities during November-February. In view of the small volume, import figures for lychees are not shown separately in the trade statistics of the importing countries. The Survey revealed that the total imports of lychees into Europe were around 300 tonnes in 1967, UK, West Germany and Switzerland accounting for bulk of the imports. Malagasy and South Africa constitute the principal supplier of lychees to European markets. Data collected during the Survey revealed that lychees were quoted (February 1968) at a cif price of $ 101 per quintal in France, $ 200 per quintal in UK and $ 240 per quintal in West Germany.

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[1] Basic Information on Fresh & Processed Fruits and Vegetables of India, Volume II, Table A-18(VIII)

Until recently, lychees used to be sold only through a few speciality shops and delicatessans, but now they are increasingly available in chain stores, super markets and vegetables grocers in many of the European countries. Their turn-over, however, continues to be small.

If the enthusiasm evinced by the trade contacted during the Survey is any indication, lychees appear to hold out considerable promise of becoming one of the important tropical fruits with adequate market prospects in European countries. According to many importers, the present limited imports of lychees should be taken to reflect more the paucity of supplies of quality lychees rather than the absence of demand for this item. They also expressed the view that quality of Indian lychees is superior to that offered by South Africa, Malagasy and attractive, and India should not have any difficulty in quoting competitive prices.

Though the present market for lychees in Europe does not exceed 300 tonnes, the Survey revealed that substantial business in lychees could be built up if India can meet overseas requirements in terms of delivery schedules, packaging and prices. UK appears to hold out the highest potential in view of sizeable Asian population. A large number of importers in UK as well as France showed interest in importing lychees from India provided they could be air-lifted and offered at competitive prices. It would, however, be necessary to undertake adequate promotional measures for wide-spread sale of lychees in the European countries.

Against the background of adequate potential available in European countries for lychees and India's capability of supplying the right variety at acceptable price, it is envisaged that India could export approximately 500 tonnes of fresh lychees by 1970-71 and 2,000 tonnes by 1975-76 on the basis of the existing production base available in the country. Countries offering considerable potential for Indian lychees include UK, Switzerland, West Germany, France and Belgium.

B. Canned Lychees

The market for canned lychee wholes though not substantial, is growing rapidly in the European markets. Presently, UK constitutes the most important market importing canned lychees, its annual imports averaging at 100 tonnes. The current demand for lychee wholes in other countries is limited. China (Mainland) and Hong Kong are the major suppliers of canned lychees and their cif prices in UK ranged between $ 12-15 a case of 24x2½ during February 1968.

Despite considerable production of fresh lychees in India, canning of lychees has not developed to any significant extent. Very few canning units in India are reported to be processing lychees on a limited scale, mainly for domestic consumption. The Survey has revealed that the quality of Indian lychees is at par with Chinese fruit. Besides labour costs in India are not high. It is, therefore, considered possible to build up an export oriented lychee canning industry in India mainly for meeting the overseas requirements.

C. Recommendations

The Survey has revealed that reasonable prospects exist in European as well as South-East Asian countries for the sale of fresh and processed lychees. Export marketing of fresh lychees, however, should be preceded by developing adequate infrastructure in the country for proper marketing of the fruit. Likewise, capacity will need to be created for the manufacture of processed lychees in the form of lychees wholes and lychee juice. Following steps are recommended for immediate implementation.

(i) Lychees have a tendency to lose their outer colour after harvested from the tree, reducing their marketability to a considerable extent. Experiments conducted in Madagascar have shown that if lychees are cooled immediately after harvest through a process called 'Hydro Cooling', it is possible to arrest the discolouration process. There is need to acquire the technical know how in this respect.

(ii) In order to ensure that lychees are of optimum maturity and colour, it is necessary to harvest them at the right stage. This aspect needs scientific investigation.

(iii) Due to the high perishable nature of the lychees, there is need to keep them in refrigerated condition not only after their harvest but also during transit from the production points to the importing markets. Malagasy's experience has shown that lychees can be kept well for about 22 days, when stored at 2°C; this aspect needs to be investigated in relation to Indian lychees.

(iv) Information gathered during the Survey revealed that lychees are packed in polythene bags, each containing about 500 grams and 10 such bags placed in a cardboard carton. The use of polythelene bags is reported to be essential for preventing dehydration of the fruit and enhancing chances of their keeping quality. Suitable packing for Indian lychees needs to be evolved.

(v) Packing, grading, and cold storage facilities have to be created at convenient points in the producing areas.

(vi) In the initial stages, lychees are to be transported by air to the European markets. Considering the fact that Air India has regular flights to London with stop covers at Geneva, Frankfurt, Rome, Paris and Brussels, it would be advantageous to establish suitable arrangements for air lifting lychees to these markets.

(vii) It is considered necessary that a modern processing plant should be set up, preferably in Bihar where adequate production base for high quality lychees exists. As the season for lychees is limited to two months, the plant will have to take up processing of other fruits such as mangoes, guavas and papayas and vegetables like peas, beans and tomatoes for which adequate export potential is available in foreign markets. For determining the location of a unit as well as deciding other operational aspects, a feasibility study should be undertaken on an immediate basis.

4.7 DECIDUOUS FRUITS

Background

Deciduous group of fruit comprising apples, peaches, pears, apricots, strawberries and plums are principally grown in the temperate regions of the world. North America and the southern European countries in the northern hemisphere and Australia, Argentina and South Africa in the southern hemisphere are the major temperate fruit producing countries. A large international trade has also been built up for these items, in the fresh as well as processed forms, in view of the traditional preference of the consumers in Western countries for temperate over tropical fruits.

Production of temperate fruits in India, as compared to the growth achieved by the major producing countries of the world, is still fractional. Total output has been averaging at 100,000 tonnes during the past few years, major proportion of which is consumed in fresh form within the country. Consequently, neither production of processed items nor exports has attained any sizeable volume.

1. APPLES

A. Fresh Apples

World Production

Apple is a temperate fruit cultivated extensively in both the hemispheres. Major apple producing countries, however, comprise USA, Australia, Canada, France, Italy, West Germany, Netherlands, Bulgaria, Turkey, Japan, Lebanon, Argentina and

Mexico. Fresh market provides the main outlet for apples but increasing attention is being paid for utilising apples for canning, juicing, drying and other manufacturing purposes in North America and in certain European countries.

Table varieties (cooking and dessert) account for greater part of world apple production, but cider variety is extensively grown in several European countries, notably France. World output of apples had fluctuated between 15.8 million tonnes and 21.4 million tonnes during 1960-61 and 1965-66, as can be seen from the figures given below. Countrywise prodvction statistics are provided in Annexure F-1.

World Production of Apples[1]

(Million Tonnes)

	All Varieties	Table Varieties	Exports* (Million Tonnes)
1958-59	21.4	15.8	1.0
1959-60	14.2	12.6	1.4
1960-61	21.4	15.8	1.4
1961-62	15.1	13.0	1.5
1962-63	19.7	15.1	1.6
1963-64	18.4	16.4	1.4
1964-65	19.4	16.7	1.6
1965-66	19.0	16.7	1.9

*Relate to calendar years

The fluctuations in world output reflect mainly the 'alternate bearing' nature of French cider crop and not so much the annual swing in the table apple production which actually had shown perceptible increase in recent years. While, therefore, the total world apple production in 1963-64 showed a downward swing associated with poor European year (French cider crop) amounting to 18.3 million tonnes as against 19.7 million tonnes in 1962-63, the world table apple crop was able to register a rise for two successive years reaching 16.7 million tonnes high in 1965-66.

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[1] Instituto Per Le Ricerche E Le Informazioni di Mercato E La Valovizzazione deua Produzione Agricola, Rome, Italy, 1967.

Varieties. Delicious group of varieties, Jonathan, Boskeep and Cox Orange Pipin are most important varieties accounting for the major share of the total production in Europe. Varietywise production of apples in France and Italy - the two most important apple producing countries in Europe - is given at Annexure F-2. Details relating to various varieties produced in different countries and their seasons of harvest are furnished in Volume IV, Table A-5, of the Report.

Seasons of Harvest. Harvesting of apples in Europe is concentrated in the period August-November. Certain early and late varieties, which are being increasingly cultivated in these countries, have contributed to prolonging the marketing season from July to March. In recent years, because of development of improved cold-storage techniques and controlled atmospheric storage, the marketing season for apples has been extended upto April and even early June. In view of these developments, seasonal constraints in respect of production and marketing of apples have almost been eliminated. During the Survey it was gathered that in North Italy more than 40% of the production of apples is being stored under controlled atmospheric conditions for marketing them in the off-season.

World Trade

World annual exports of apples were steady around the level of 1.4 million tonnes during 1958 to 1963, and showed a slight improvement reaching 1.9 million tonnes in 1965-66. Exports of apples represents on an average about 6% of the world output. The main exporting countries include Canada, Australia, Italy, Bulgaria, South Africa, Argentina and Lebanon, whose combined share, on an average, amounts to 80% (Annexure F-3).

A large part of the world trade in fresh apples caters to the requirements of the European markets. About 50% of the European demand (excluding East Europe) is, however, met by intra-European trade and the rest by imports from countries like Argentina, Australia and USA, mainly during the off-season period. Besides Europe, other importing countries include Malaysia, Hong Kong and Philippines in the Far East, Egypt, Algeria, Morocco, Syria and Jordan in West Asia and Cuba, Venezuela and Brazil in the Americas. Detailed statistics of imports by major consuming countries are given in Annexure F-4.

Production and Trade in Survey Countries

Data relating to production, imports and exports of apples in respect of Survey countries are provided in Volume III, Tables A-1 to 3, of the Report. The position obtained in these countries during 1966 is indicated in the following table:

Production, Imports and Exports of Apples[2]

(Thousand Tonnes)

Survey Countries	1966		
	Production	Imports	Exports
France	1,241	83	136
West Germany	1,473	497	2
Italy	2,584	Neg	492
Netherlands	368	22	1
Belgium-Luxemburg	205	50	12
UK	267	264	-
Spain	350	-	Neg
Switzerland	220	21	2
Sweden	184	56	Neg

(Contd. next page)

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[2] Production statistics are taken from Volume III, Table A-1 and import & export data from FAO. Countrywise imports and exports given at Volume III of Tables A-2 and A-3, of the Report, show close agreement with FAO figures.

Survey Countries	1966		
	Production	Imports	Exports
Denmark	77	15	10
Greece	166	-	10
Yugoslavia	214	9	Neg
Lebanon	104	Neg	94
Iraq	19	23	-
Kuwait	-	5	-
Bahrain	-	-	-
Thailand	-	-	-
Philippines	-	9	-
Hong Kong	-	35	-
Singapore	-	16	-
Malaysia	-	77	-
Total	7,472	1,112	759
World Total	19,000	1,900	16,700

It will be seen that apple is produced in greater or smaller quantities in all European countries, Italy, West Germany and France constituting the three foremost producers. In West Asia, Lebanon is the leading producer. Commercial production of apples in other Survey countries is not significant.

Europe. More than 80% of imports into EEC countries are drawn from within the Community itself, mainly from Italy. The balance comes from the Southern hemisphere countries like Argentina, South Africa and Australia during the off-season (April-June). The Scandinavian countries and Switzerland are, in general, self-sufficient during the season and in the off-season period they import from the Southern hemisphere countries. UK obtains about 60% of its annual import requirements from Australia, New Zealand and South Africa, about 20% from North America and 15% from Italy. It is important to mention that UK allows unrestricted apple imports only from Commonwealth countries (excluding

Canada), Irish Republic and South Africa. Imports from other sources are subject to a global quota which was 22,800 tonnes for July-December, 1967 and 91,670 tonnes for January-June, 1968 period.

West Asia. Lebanon constitutes the major supplier of apples to the countries of West Asia. Iraq, Kuwait and Bahrain derive their supplies almost entirely from this source. Average annual imports into these countries may be placed at 27,000 tonnes.

South-East Asia. Philippines, Hong Kong, Thailand, Malaysia and Singapore obtain their imports from Australia, Japan, New Zealand and Mainland China (caters mainly to Hong Kong and Malaysia).

The sourcewise pattern of imports would clearly show that market opportunities for countries outside Europe are restricted to April-June period and that new comers like India will have to compete with the traditional off-season suppliers like Argentina, Australia and South Africa.

Prices. The average producers' prices in Italy during 1966 and 1967 seasons are indicated below:

Producers' Prices for Apples in Italy[3]

(Dollar/kg)

Variety	Market	Average Apple prices in production Areas Free Vendor's Warehouse	
		1966	1967
Jonathon	Verona	0.07	0.09
Stark Delicious	Ferrara	0.11	0.16
Golden Delicious	Cunco	0.10	
Renetta Canada	Cunco	0.06	0.08
Imperator	Verona	0.09	0.10

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[3] IRVAM, Italy

Wholesale prices for table apples in selected Survey countries are given in Volume III, Table A-4, of the Report. In order to indicate the range of seasonal and off-seasonal prices, UK has been taken as representative country and the average wholesale prices ruled in Covent Garden, London during 1967 are given below:

Average Wholesale Prices for Table Apples[4/]
(Red Golden Delicious)

(Covent Garden, London)

(Shillings)

1967	Italy (18-20 lbs)	France (37 to 40 lbs)	Australia (38-42 lbs)	South Africa (38-40 lbs)
January	15-17	33-37	-	-
February	15-17	32-36	-	-
March	15-17(Belforte)	36-42	-	44-50
April	16-20(Belforte)	50-54	52-65 (Granny Smith)	46-55
May	-	-	47-55	47-60
June	-	-	55-62	46-50
July	-	-	59-67	-
August	-	75-85	-	-
September	-	-		

India's Position

Major apple growing areas in India are Jammu and Kashmir, Himachal Pradesh, Uttar Pradesh (Kumaon Hills), West Bengal (Darjeeling) and (Nilgiris) Madras State. Assam, Manipur and Tripura grow this fruit to a limited extent. Area given under this crop was estimated at 7,245 hectares and production 49,190 tonnes in 1961-62. Exports of apples are insignificant.

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[4/] Fruit Trade's Journal, Year Book, 1968, London.

Statewise Production of Apples in India[5]
(1961-62)

	Area (Hectares)	Production (Thousand Tonnes)
Jammu & Kashmir	3,240	29.9
Uttar Pradesh	2,610	12.0
Himachal Pradesh	1,250	5.7
Punjab	300	1.4
Others	25	0.2
Total	7,425	49.2

The varieties of apples grown in main producing areas are as under:

Jammu and Kashmir:	Irish peach, Benoni, Cox's Orange Pippin, Anne Elizabeth, Golden Russet, Yellow Newton and Delicious.
Uttar Pradesh :	Early varieties: Red Astrakhan, Beauty of Bath, Early Shanburry and Benoni. Mid-Season: King of Tomkin's Country, King of Pippin and Red Delicious. Late Variety: Pick's Pleasant; Yellow Newton, Pippin, Rome Beauty and Buckingham.
Himachal Pradesh :	Early Variety: Red June, Stark Earliest and King of Pippins. Mid-season: Red Delicious, Royal Delicious and Golden Delicious. Late Variety: Rus Pippin and Granny Smith.

The present trend, however, is towards growing varieties of Delicious group like Golden, Red, Starking and Richard. The main seasons of harvest of apples in different regions are as follows:

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[5] Directorate of Agricultural Marketing, Nagpur.

Himalayan Region	Mid June to October
Jammu & Kashmir	End June to Mid-December
Uttar Pradesh, Himachal Pradesh and Punjab	Mid July to Mid-September
South	May to Mid-August.

Prices

Average monthly prices of apples in selected markets prevailed during 1965-67 are given in Volume II, Annexure A-25. The following table indicates the average month-end prices of apples in Delhi and Madras markets.

Average Month-end Prices for Apples in Delhi and Madras Markets

Rs/Quintal

Months	Delhi	Madras
January	288	223
February	281	240
March	294	250
April	341	-
May	488	-
June	-	-
July	267	341
August	388	281
September	275	294
October	300	406
November	222	412
December	210	400

Prospects

India's prospects for exports of apples are not considered bright in the short run owing to the small volume of output on the one hand, and the absence of an organised apple growing industry, on the other. Unless the production base for Delicious varieties of apples is expanded on a planned basis it would be difficult to envisage India exporting apples even in the long run. The most suitable areas for planned cultivation of apples are considered to be Jammu and Kashmir, Himachal Pradesh, Uttar Pradesh and Madras.

The long term prospects, however, have to be viewed in relation to the recent developments taking place in major producing countries. During the Survey it was learnt that France and Italy are now attempting to store apples under controlled atmospheric conditions to prolong the marketing season round the year. This development is expected to affect the prospects of the traditional 'off-season' (April-June) suppliers such as Argentina, South Africa and Australia in the long-run.

Market opportunities in West Asia are also limited as this region is well served by Lebanon whose output is expected to rise considerably in the next few years. The prospect of exporting apples to South-East Asian countries is dim in view of stiff competition from Japan, Australia, China (Mainland) and Taiwan. It is therefore envisaged that exports of fresh apples would only be about 10 tonnes by 1970-71 and 100 tonnes by 1975-76.

B. Processed Apples

Apart from cider, the important processed products comprise canned apples, apple sauce and apple juices. Jams, jellies and marmalades which are also produced are relatively unimportant.

Production. Breakdown of world production of individual apple products are not available. Data on apple juice production is normally included along with other juices. Information on production of processed apples and apple sauces in major supplying countries is given below:

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Production of Canned Apples and Apple Sauce in Selected Countries [6]

(Thousand Tonnes)

	1963	1964	1965
USA	334.7	378.6	400.1
France	-	-	43.0
West Germany	20.0	33.7	39.4
Canada	17.1	16.4	17.2
Japan	8.7	15.0	15.8

From the above table it is obvious that USA, France and West Germany are the largest producers of processed apple products.

World Trade

Data on world trade in processed apple products are not available. West Germany and UK are considered to be the principal markets for apple sauce and apple juice. Imports of unsweetened canned apples into UK, for instance, increased from 8,294 tonnes in 1963 to 10,707 tonnes in 1966; West German imports of apple juice are estimated to have increased from 6,200 tonnes in 1964 to 8,000 tonnes in 1966. It is reported that Kuwait in West Asia and Singapore in South-East Asia import considerable quantities of apple juice from Lebanon and Australia, respectively.

India's Position

Apple juice constitutes the main processed item produced in India. Annual average production is estimated at 400 tonnes, major proportion of which is consumed within the country. Exports of processed apple products are negligible.

Considering the smallness of the production-base, sizeable exports of processed apple products from India are precluded, for the present.

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[6] The Almanac of the Canning, Freezing, Preserving Industries, Chacago, 1967.

2. PEACHES

Background

At the outset, it may be stated that India's interest in peaches should be viewed mainly from the long range point of view. In the ensuing paragraphs an attempt has been made to delineate the pattern of production of and trade in peaches in the world, production of peaches in the survey countries and the ecological requirements of peach cultivation. An idea of peach production in India has been provided thereafter.

A. Fresh Peaches

World Production and Trade

World production of peaches increased from an average of 2.8 million tonnes per annum during 1952-56 to 4.5 million tonnes in 1961, and to 5.2 million tonnes in 1965. The countrywise production figures for these periods may be seen at Annexure F-5. The following table indicates the regional distribution of production:

Regionwise Production of Peaches[7]

(Thousand Tonnes)

Regions	1963	1964	1965
Europe	2,152	2,286	2,304
North America	1,714	1,754	1,705
Latin America	404	366	472
Near East	86	141	93
Far East	221	245	286
Africa	139	159	176
Oceania	102	110	123
Total	4,818	5,061	5,159

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[7] FAO Production Year Book, 1966.

The respective shares of the principal world producers may be seen in the following table:

Principal Peach Producing Countries[8]
(1965)

(Thousand Tonnes)

Countries	
USA	1,779
Italy	1,300
France	485
Japan	229
Spain	170
Australia	106
Argentina	278
South Africa	139
Greece	100
Others	613
Total (incl. Others)	5,159

It may be seen that USA, Italy and France put together account for as much as 69% of the world output. It has been reported that considerable expansion in production will take place in the major producing countries (particularly in Europe) by 1970.

Utilisation. Pattern of utilisation of peach production in selected Survey countries with projections for 1970 is indicated below. The comparative figures for USA, the leading producer in the world, are also given:[9]

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[8] FAO Production Year Book, Op. cit.

[9] OECD figures and Survey data. Data for Spain relate to 1966.

(Thousand Tonnes)

	USA		Italy		France		Spain	
	1965	1970	1965	1970	1965	1970	1965	1970
Production	1,779	NA	1,300	1,500	485	750	138	190
Exports	16	NA	218	300	449	NA	1	1
Processing	833	NA	30	50	8	40	78	80

It may be seen that excepting in USA, bulk of the production is utilised in the fresh form either for home consumption or for exports. In USA, nearly 50% of the crop goes for processing and the same is true of Spain.

World Trade

Italy is by far tne leading exporter in the world providing nearly two-thirds of total export supplies. In addition, a rapid development is taking place in France and Greece, where net exports reached as much as 49,000 and 43,000 tonnes respectively in 1965, except in 1966 when France was a net importer owing to crop failure. West German market provides the major outlet for all the peach producing countries of Europe followed by Switzerland and UK. Directional movement of exports from these countries during 1965 and 1966 is indicated below:[10]

(Thousand Tonnes)

Importing Countries	Supplying Countries					
	France		Italy		Greece	
	1965	1966	1965	1966	1965	1966
EEC Countries						
West Germany	31.2	2.3	141.5	156.2	-	45.1
Netherlands	2.0	0.6	-	-	-	0.4
Belgium-Luxemburg	4.9	1.8	15.1	19.4	-	-
France	-	-	-	20.5	-	Neg

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[10] IRVAM, Rome

Importing Countries	Supplying Countries					
	France		Italy		Greece	
	1965	1966	1965	1966	1965	1966
EFTA Countries						
UK	6.4	2.1	14.4	19.4	-	0.4
Norway	-	-	-	-	-	-
Sweden	1.1	0.2	-	-	-	Neg
Denmark	0.8	0.2	-	-	-	Neg
Switzerland	1.6	0.4	23.3	25.4	-	Neg
Austria	-	-	16.9	12.4	-	Neg
Others	0.5	0.5	13.3	16.1	-	Neg
Total	48.6	8.1	224.5	269.5	-	46.5

Peach Cultivation in Selected Survey Countries

Ecological Requirements. Peaches can be grown in a variety of soils but deep alluvial soil is considered ideal for its cultivation. It is important, however, that the calcareous content in the soils should be low, preferably not above 7%. The main ecological requirement for successful cultivation of peaches, however, relates to the atmospheric temperatures during blossoming and fruiting periods. Generally speaking, the temperature requirements are as follows:

i) 16°C to 23°C during the winter period
ii) Less than 3°C during budding and blossoming period
iii) 0°C during fruiting period

Besides the above, peach cultivation also requires specific 'chilling periods' which vary according to the varieties. Details collected in this respect during the survey are given below[11]:

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[11] Department of Agriculture, Gard, France, and National Institute of Fruit Culture, Rome.

Table Varieties	Total Chilling Periods (less than 7°C) hours
June Gold	450
Mary Gold	650
Southland	650
Red Cap	650
Coronet	700
Cardinal	750
Red Haven	850
Elberta	850
Dixired	950
May Flower	1,100

For canning varieties such as Vivian, Everts, Fortuna, Jeronimo, Baby Gold, Dixon I, Sudanell, Vesuvio, 'chilling periods' have not yet been determined.

Varieties. A number of varieties are being grown in the major producing countries, although the tendency is towards encouraging cultivation of selected varieties which are not only suited to local conditions but also help in extending the period of harvests. In Italy, for instance, more than 25 varieties are grown. But the largest area extends over varieties like Hale, Cardinal, Dixired, Vesuvio and varieties of Morettine group, all being table varieties. Canning varieties are being grown at present only in limited areas. In fact, the choice varieties like Vivian and Everts have been planted only three years ago and the first harvests are expected in 1968. It is reported that the performance of these varieties has not been satisfactory.

In Greece, the mid-season variety, Elberta, accounts for over 50% of the total production. By providing planting material free of cost and extending liberal production loans, the Government of Greece has been encouraging the producers to grow early varieties like Arm Gold, Early Gold, Gold Dust and late varieties like J.H. Hale and Rubido since 1960. Presently, peach cultivation is concentrated in North Greece (Macedonia) which is suitable mainly for growing table varieties. Efforts are being made to grow clingstone peaches in the warmer climate of South Greece (Peloponius). The significance of these developments will be known only in the next few years. Distribution of area under different varieties in Italy, is given in Annexure F-6.

Seasons and Harvests. In Mediterranean countries, peaches come to harvest by the end of May and extend upto July, depending upon the varieties. Certain late varieties, however, reach fruition during the month of August.

Cost and Yield. Cost of production of peaches per hectare in France has been estimated as follows:

Cost of Production of Peaches in France[12]

A. Cost of raising the plantation upto bearing stage	France per Hectare Rs
i. Cost of preparation of the land	4,910
ii. Cost of cultivation:	
1st year	1,330
2nd year	2,090
3rd year	2,980
4th year	4,160
	15,470
B. Annual average cost of cultivation at other bearing stages	
i. Annual amortisation at Rs 15,470; 12	1,300

Contd....

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[12] Ministry of Agriculture, Regional Directorate, Gard, France, 1967

ii. Cost of cultivation		4,160
Total A and B	Rs	20,930
C. Average yield per hectare		20-25 tonnes

In Greece, the average cost of production in 1967 was estimated at Rs 9,375 per hectare[13].

Palmetta System. In analysing the cost aspects of Italian peach industry, it is essential to point out the significance of the Palmetta training system introduced in 1958. The system consists of a central leader which supports three pairs of inclined lateral branches. The peach branches are guided in the direction of the row over steelwires, streched horizontally, so as to facilitate pruning and harvesting. As against the 'open vase' method (6x6 meters), spacing given in palmetta system is 4½ meters between the rows and 5½ meters between the plants. By reducing the spacing, the population per hectare has been increased from 278 to 400 trees so that overall yield per hectare is maintained.

Yield. The average yield per hectare varies according to varieties, soils and climatic conditions. However, it has been reported that in good orchards, an yield of 20-30 tonnes per hectare can normally be expected.

Producers' Prices. Average price paid to the producers during 1967 was valued at $ 70 in Spain, $ 100 in Greece and $ 106 in Italy for peaches meant for fresh markets. When sold for canning purposes, the prices are usually about 30 to 50% lower than the fresh market prices. Total earnings from a hectare, on the assumption of 20 tonnes average yield, roughly work out to $ 1,500 to 2,000.

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[13] Ministry of Agriculture, Athens, Greece, 1967.

Peach Production in India

Cultivation of peaches in India is confined to temperate sub-tropical regions of Uttar Pradesh, Himachal Pradesh, Punjab, Jammu and Kashmir and Madras (Nilgiris). The total production in 1961-62 was estimated at 7,324 tonnes, from an area of 1,260 hectares. The statewise break-up was as follows:

Region	Area (Hectares)	Production (Tonnes)
Uttar Pradesh	820	3,770
Jammu & Kashmir	220	2,050
Punjab & Haryana	130	900
Himachal Pradesh	80	554
Madras	10	50

As compared to an average yield of 20 tonnes per hectare obtained in the producing countries of West, yield in India is very low ranging from 5 to 10 tonnes only.

Varieties. The varieties presently grown are non-descript and do not seem to belong either to clingstone or freestone variety. Peach crop is harvested in June-July in the hilly regions and in May to mid-July in the plains.

Utilisation. Except for a small quantity utilised for canning purposes in Jammu & Kashmir, peaches are entirely utilised for consumption in the fresh form and that too mostly in the respective producing areas.

Objectives of Development of Peach Production in India

A comparative study of the production and trade pattern of peaches in U.S.A., France, Italy, Spain and Greece with that of India, for identifying areas of opportunity for Indian peaches, clearly brings out the disparity and disadvantages hampering the Indian peach industry. It can be clearly gainsaid that India's interest does not lie in the market for fresh peaches in the short run or in the near future. The short term prospects of exporting canned peaches from India are also none too bright; this does not rule out the entry of India into the world market for canned peaches at a later stage. It may, therefore, be stated that India's interest in peaches arises mainly out of the long term point of view. The considerations which underline the need for organised growth of the industry are:

i) Certain areas in Punjab, Himachal Pradesh, Kashmir, Kodaikanal and Ooty may be suitable for commercial cultivation of this crop, especially clingstone varieties suitable for canning purpose;

ii) The cultivation of peaches could be more profitable in terms of per hectare return and thereby may contribute to better land resource utilisation and economic development of the concerned regions;

iii) For quality canned peaches, it is possible to find ready markets in foreign countries, particularly in Europe;

iv) The major producing countries of peaches in Europe like Italy and Greece have reportedly some ecological limitations in growing good canning varieties. Efforts are being made to overcome these problems. Further investigations on this particular aspect will be necessary to determine the intensity of these limitations and help assessing India's prospects.

Additionally, if India desires to have a stake in the world market for canned peaches, peach production in India, ipso facto has to be organised on parity with those of the major peach producing countries.

A detailed plan of developmental programme can, however be formulated only when horticultural, economic and marketing aspects are thoroughly gone into and their implications fully analysed. For conducting the study of the nature envisaged above, India could seek the assistance of Food and Agricultural Organisation under Extended Programme of Technical Assistance of United Nations or explore possibilities of securing services of specialists from major peach producing countries like U.S.A, Italy or France.

B. Processed Peaches

Processed peaches are mainly available in two forms: (i) canned peaches and (ii) dried peaches. Jams, jellies and marmalades constitute another group of processed peach products. Among these, from international trade point of view, canned peaches are of great significance. Dried peaches are reported to account for less than 5% of the total quantity of processed peaches. Trade in peach jams, jellies and marmalades is also reported to be of not much significance.

Production

The major producers of canned peaches in the world are U.S.A., Australia, Canada, South Africa and Japan. Data on their production of this item is provided below:

Major Producers of Canned Peaches[14]

(Thousand Tonnes)

Producing Countries	1964	1965	1966
U.S.A.	759,920	599,597	738,358
South Africa	70,156	87,373	94,778
Australia	67,993	88,332	93,126

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[14] The Almanac of the Canning, Freezing, Preserving Industries, 1967

Producing Countries	1964	1965	1966
Japan	57,508	62,363	66,361
Argentina	34,986	23,480	14,096
Italy	34,476	24,990	31,987
Canada	20,604	12,893	13,403
Spain	19,237	24,398	20,400
Chile	14,382	15,300	14,586
U.K.	3,142	3,448	2,734

The main types of canned peaches entering international trade comprise peach nectar, peaches in syrup, jams, jellies and marmalades of peaches, peaches preserved or prepared in alcohol and spiced peaches. Peaches are also packed without sugar which are largely used for repacking. Peaches in syrup, however, constitute the most important form of canned peaches in international trade.

World Trade

Of the estimated 4 million tonnes of world trade in canned fruits, 25% or a million tonne is estimated to account for by canned peaches. USA, is the leading world exporter with about 10% of the world trade. During 1965, USA's exports accounted for 110,500 tonnes. Other important exporters include Australia, Japan, South Africa and Spain.

The principal importers of canned peaches in the world are UK, West Germany, Canada and Netherlands. Annual average imports into Survey countries together may be placed at 200,000 tonnes valued at $ 35.0 million between 1964 and 1966.

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Imports of Canned Peaches by Major Countries[15]

(Thousand Tonnes)

Country	1964	1965	1966
U.K.	106	102	100
West Germany	65	N.A.	66
Canada	18	24	26
Netherlands	9	11	11
Sweden	9	8	8
Belgium	7	7	7
France	5	N.A.	8

India's Position

Production of processed peach items in India is not significant. It amounted to about 100 tonnes in 1966 comprising 45 tonnes of jams and 55 tonnes of peaches in syrup. No exports of this item have been effected.

Prospects

As indicated at the outset, prospects for export of processed peach products from India should be viewed from the long range point of view. Production base both in the horticultural and processing sector has to be strengthoned before embarking upon a planned programme of canned peach exports. As suggested earlier, if peach cultivation is undertaken on an extensive scale in selected parts of the country with a view to developing a strong processing industry, it should be possible to export about 10,000 tonnes of canned peaches from India by 1975-76.

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[15] Basic Statistics on Fresh Fruits and Vegetables of Survey Countries, Volume III, Table B-2 of the Report, and Commonwealth Economic Committee, London.

3. PEARS

A. Fresh Pears

Pears occupy a prominent place in the world fresh fruit trade being next in importance only to apples and peaches. International trade in processed pears is mainly confined to pear juice and pear halves. Perry pears are mostly utilized to produce cider.

World Production

During 1966, world output was of the order of 6.4 million tonnes. It has been estimated that table pears account for over 90% of total world production of all types of pears. Bulk of world's production occurs in Europe and United States. Italy, West Germany and France comprise the major producers in Europe. Others include China (Mainland), USA, Japan, South Africa, Australia, Brazil and Turkey. While countrywise data are given in Annexure F-7, data on production of table pears in principal countries are provided below:

Production of Major Producers of Table Pears[16]

(Thousand Tonnes)

	1964	1965	1966
Italy	1,063	962	NA
China	800	800	800
U.S.A.	656	454	671
West Germany	476	285	351
France	325	277	296
Japan	319	335	325

Contd....

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[16] Production Year Book, FAO, Rome, 1966

	1964	1965	1966
Australia	132	114	139
Turkey	131	149	325
Argentina	112	96	104

Varieties. The popular varieties of pears produced all over the world are Lawson, Williams, Beurre Hardy, Clapp's Favourite, Doyennee du Comice, Duchesse, Rocha, Perola and Carapinheira.

Utilisation. Almost all the European pear growing countries utilise a majority of their production for home consumption in the fresh form. Less than 20% of the production, is normally taken over by the processing industries. Among the major pear growing countries like, Italy and France, nearly 25% of total production is earmarked for export. West Germany is an exception as she imports considerable quantities of pears despite sizeable home production. Canning of pears has assumed some importance during the last few years in Netherlands and Italy. In countries like USA, Japan and Australia a large part of the output goes to the canneries.

World Trade

Between 1963 and 1965, world exports of pears and quinces increased about 378,400 tonnes to 405,800 tonnes. Nearly 55% of the world exports was accounted for by the European countries. The main pear exporting countries in the world are Italy, Australia, USA, France, South Africa and Netherlands.

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Exports of Pears by Major Countries[17]

(Thousand Tonnes)

	1963	1964	1965
Italy	153.8	154.5	130.3
France	24.3	14.2	35.3
Australia	21.8	34.0	29.8
U.S.A.	18.5	25.6	29.7
South Africa	30.7	31.6	28.4
Netherlands	35.7	49.3	21.8
Total (incldg others)	378.4	448.5	405.8

World imports of pears ranged between about 368,800 tonnes and 394,876 tonnes between 1963 and 1965. West Germany and U.K. were the major importers of fresh pears in Europe, accounting for about 72% of the world trade. Other importing countries in Europe include France, Austria, Sweden, Norway and Belgium.

In West Asia, Algeria is a major market and the rest of the countries import only small quantities of fresh pears. Malaysia is an important consumer of pears in South East Asia, though other countries in this region are of marginal importance. Data on imports of fresh pears into West Germany, U.K. and Malaysia are provided below:

(Thousand Tonnes)

	Total	West Germany	U.K.	Malaysia
1963	368.8	57.6	159.3	5.1
1964	426.9	68.6	182.9	5.6
1965	394.8	52.2	147.5	7.0
1966(Est)	400.0	80.0	206.0	NA

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[17] Trade Year Book, FAO, Rome, 1966.

India's Position

Compared to the output of major producing countries, India is a fringe producer of pears. They are grown mainly in Uttar Pradesh, Punjab, Himachal Pradesh, Jammu & Kashmir and Madras (Nilgiris). Annual average output is estimated at 32,690 tonnes.

The present level of production in India is too low to visualise any fresh pear exports. The basic step would be therefore to strengthen the production-base in India for obtaining a sizeable output in the near future. Once substantial output starts being realised, efforts can be made in the initial stages, to tap Malaysian and other neighbouring South East Asian markets. Similar efforts can be made with respect to West Asian countries also.

B. Processed Pears

International trade in processed pears is of lesser significance than that of fresh pears. Processed pears mainly consist of canned pears and pear juice. Jam, jellies and marmalades of pears are of minor importance.

Production

Processing of pears is of greater significance among the pear growing countries outside Europe. European countries are yet to catch up with USA and Australia in processing of pears though in recent years, Italian and Dutch output has considerably expanded. Data on production of canned pears in major pear producing countries are provided below.

(Next Page)

Production of Canned Pears in Major Countries[18]

(Thousand Tonnes)

	1964	1965	1966
U.S.A.	227	128	220
Australia	64	49	69
South Africa	26	23	30
Italy	17	14	NA
Canada	17	12	NA
Japan	4	7	7

World Trade

UK is the world's major importer of canned pears followed by Canada, Sweden, Netherlands and Belgium. Data on their imports of this item are provided below:

(Tonnes)

	1964	1965	1966
U.K.	70.7	57.3	67.3
Canada	4.5	5.1	5.8
Sweden	2.1	2.6	2.6
Netherlands	0.9	0.4	1.0
Belgium	0.7	0.4	0.8

Australia is the leading supplier to most of these markets. The other important suppliers include Italy, U.S.A., Japan and China.

India's Position

With a very small production-base estimated at 425 tonnes in 1966, India cannot hope to export processed pears to the world markets for the present. Long range prospects for export depend upon substantial increase in production of fresh pears and expansion in canning capacity.

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[18] The Almanac of the Canning, Feezing, Preserving Industries, Chicago, 1967

4. STRAWBERRIES

Background

Strawberries, in fresh and processed forms, are of considerable importance in international trade. Production and processing of strawberries in India viewed from the international angle, is quite small. However, owing to favourable harvesting periods, off-season exports of fresh strawberries present fairly bright prospects.

A. Fresh Strawberries

Production

Strawberries are grown in open fields and under glass, production in the latter category being small. Data on world production of strawberries are not available. Information on production of strawberries in Survey countries is provided below:

Production of Strawberries in Selected Survey Countries [19]

(Tonnes)

Countries	1964	1965	1966
Italy	63,022	57,168	69,021
France	57,790	59,810	51,970
Netherlands	36,815	32,000	28,432

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[19] Basic Information on Fresh Fruits and Vegetables of Survey Countries, Volume III, Table A-1, of the Report.

Countries	1964	1965	1966
U.K.	35,800	33,600	40,000
Belgium-Luxemburg	27,180	27,200	31,000
West Germany	18,591	21,100	24,600
Denmark	9,200	8,700	7,700
Spain	6,000	6,000	7,000
Sweden	3,000	N.A.	N.A.

Apart from the above mentioned countries, the other known major producers include U.S.A., Israel, Kenya, Malta, South Africa, Cyprus, New Zealand and Australia.

Seasons of Harvesting. The harvesting season for strawberries varies from region to region as indicated in the table below:

Country	Harvesting Season
Cyprus	April-May
France	April-June
West Germany	May
Holland	April-May
Israel	January
U.S.A.	March-May
Spain	February-April
Kenya	September-May
New Zealand	December-May
Malta	March-July

Almost all the European countries, with the exception of Spain, harvest strawberries mainly during April-June period, when the supplies are high and price realisations low. During the rest of the year, European markets mainly depend upon overseas supplies.

Varieties. The varieties preferred in the European markets are Souvenir de charles Machirouse, Madame Moutot, Regina, Turrey, Tioga (Tayuga) and Salona. Israel, in recent years, has been trying to popularise Early Dawn and Larsen varieties in the European markets.

World Trade

Data on international trade in fresh strawberries are also not available. Data on imports of frosh strawberries by Survey countries are given below.

Imports of Strawberries by Survey Countries[20]

(Tonnes)

Importing Countries	1964	1965	1966
West Germany	43,401	47,744	30,525
Switzerland	7,602	8,008	7,487
Netherlands	1,599	2,313	2,690
Belgium-Luxemburg	1,283	1,515	1,340
Sweden	1,045	1,338	1,078
U.K.	685	593	863
France	443	N.A.	1,058
Italy	7	9	7

A major proportion of these imports take place during the harvesting season in Europe representing mainly intra-European trade. The share of off-season imports which is relatively small, is estimated on the basis of Survey as follows.

West Germany - 400 tonnes
France - 100 "
Italy - 50 "
Switzerland - 40 "

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[20] Basic Information on Fresh Fruits and Vegetables of Survey Countries, Volume III, Table A-2.

Off-season imports of other countries are reported to be negligible, suppliers to the European markets mainly being U.S.A., Mexico, Israel and South Africa.

Prices. The average c.i.f. prices for strawberries during the season in Europe was reported to be about $ 0.50 per kg, off-season prices being much higher varying between $ 1.50 to 2.00 c.i.f. per kg. Information on wholesale and retail prices during the season and off-season periods in European markets is furnished in Volume III, Table A-4 of the Report.

Quality Requirements. The European markets are highly quality conscious and prescribe rigid standards with regard to imports of fresh strawberries. For example, in West Germany, which is the largest off-season importer of strawberries, the quality standards prescribed stipulate that 'choice' varieties should have a diameter of 30 mm for large and medium large berries and 25 mm for smaller berries. The berries must be free of faults, typical of variety and plucked with cups. Grade 'A' berries should also be free of faults and plucked with cups. The minimum diameter should be 25 mm for large and medium varieties and 20 mm for small varieties. By and large, the above stipulations would also be applicable in the case of other European markets.

Packaging Requirements. Strawberries are highly sensitive and need to be graded during harvesting for avoidance of double handling and packed in 5 kg cartons with fruit kept in 6 or 8 trays, each tray weighing about 250 gm and wrapped in cellophane paper. Israel has developed special tin trays for this purpose.

India's Position. Strawberries in India are mainly cultivated in the hilly regions, their output being very small. Maharashtra, West Bengal, Madras and Mysore are the main growing areas. Detailed data on area under cultivation and annual output are not available.

It is understood that strawberries in India can be cultivated, both in hills and plains. The varieties grown at present comprise Royal Sovereign, Srinagar, and Dispasand. Pusa Early Dwarf, a variety developed by the Indian Council of Agricultural Research Institute, is being recommended for cultivation in the plains of Northern India. Further exotic varieties like Torrey, Tioga and Solana are considered suitable for growing in India.

Strawberries are at present harvested during May and June in hills and February to April in the plains.

Prospects for India

India's interests lie mainly in exploring the market opportunities during their off-season period, that is prior to April when small quantities are mainly available from the plains. Hence sizeable exports are not capable of being realised unless strawberry cultivation in the plains is extended substantially. Meanwhile, attempts to introduce Indian strawberries in the European markets during off-season should be made forthwith on the basis of trial consignments. This step is being suggested mainly with a view to testing the acceptability of Indian strawberries in European markets.

If concerted efforts are made on the production and export of strawberries, it is estimated that India can achieve an export of 75 tonnes by 1970-71 which can be rapidly increased to 1,000 tonnes by 1975-76.

B. Processed Strawberries

Processed strawberry items include i) strawberries, bottled or canned, ii) provisionally preserved in brine, iii) chilled and frozen strawberries, and iv) jams, jellies and marmalades. Though all these items enter into international trade, canned or bottled strawberries constitute the volume product.

World Production and Trade

Data on World production and trade in processed strawberries are not available. On the basis of the Survey data, it may be indicated that Netherlands, USA, Poland, Bulgaria and Hungary supply most of the processed strawberry items to European countries. Of the importing countries, West Germany has an important place with an annual in-take of about 11,000 tonnes of canned strawberries. Other importing countries include UK, Sweden and Belgium-Luxemburg.

India's Position

According to available information, only strawberry jams are produced in India on a very small scale for meeting the civilian and defence requirements. Export prospects appear to be negligible in view of the limited production of fresh strawberries in India at present.

5. APRICOTS

Apricots are grown from varieties of Prunus armeniaca in most of the temperate regions. A large proportion of the world apricot crop enters international trade in the form of canned, pulped or dried fruit. Trading in fresh apricots is mainly confined to movements within Europe.

A. Fresh Apricots

Production

Apricots are commercially cultivated in the countries of North America, Europe, North Africa and West Asia. Amongst the southern hemisphere countries important producers include Australia, South Africa, and Argentina. Nearly 50% of the world output is however accounted by the three leading producers of apricots namely USA, Spain and France in that order.

Production of Apricots in Selected Countries[21]

(Thousand Tonnes)

	1963	1964	1965
USA	182	203	206
Spain	108	119	194
France	163	36	112
Turkey	76	102	88
Italy	60	65	71
Hungary	104	98	69
Australia	35	43	46
Total (incldg. others)	1,103	1,051	1,099

Varieties. Apricot varieties cultivated in Europe are mainly of Spanish origin, important of which are Bulido, Reales Finos, Mauricios, Moniques and Caninos. The principal American varieties are Colorado, Nancy Peach and Pearlas. The dominant variety in South Africa is Royal.

Seasons of Harvest. The fruit is harvested between May and August in Europe while in Australia and South Africa the season is confined to December-February.

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[21] FAO Production Year Book, Rome, 1966

World Trade

Though data on world trade of apricots are not available, it is reported that the level of trade in fresh apricots differs widely from year to year according to variation in crops and is virtually confined to movements within Europe. Spain is the world's leading exporter of fresh apricots followed by Hungary, Italy and France. Apricot exports from the Survey countries during 1964-66 averaged at 26,390 tonnes, per annum. Greece, in recent years, has emerged as an important supplier of fresh appricots to the European markets.

Exports of Fresh Apricots from Survey Countries[22]

(Tonnes)

	1964	1965	1966
Spain	17,203	16,668	16,154
Italy	6,656	11,018	10,567
Greece	N.A.	1,369	9,535
Total	23,859	19,055	36,256

West Germany, Switzerland, France and UK constitute the major importing countries. During 1966, imports into Survey countries, as shown below, were of the order of 51,177 tonnes of which 27% or about 14,921 tonnes originated from outside Europe. Australia and South Africa were the main non-European suppliers.

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[23] Basic Statistics on Fresh Fruits and Vegetable of Survey Countries, Volume III, Table A-3

Fresh Apricot Imports into Survey Countries[23/]

(Tonnes)

	1964	1965	1966
West Germany	17,432	24,484	18,031
Switzerland	8,436	16,611	10,653
France	6,911	N.A.	9,043
Italy	5,625	246	6,230
Belgium-Luxemburg	3,302	2,760	3,650
U.K.	3,878	3,854	3,471
Netherlands	-	87	99

Of the West Asian and South Asian Survey countries, only Lebanon and Iraq import fresh apricots in limited quantities. During 1966, imports of these countries amounted to 446 tonnes, Greece and Italy being the suppliers.

India's Position

During 1961-62, India's production of apricots amounted to 8,400 tonnes. Total area under this crop, mainly located in Jammu & Kashmir and Himachal Pradesh, was estimated at 1,510 hectares.

Prospects

Importance of apricots in international trade is next only to that of peaches and pears. From the long range point of view it will be advantageous to explore possibilities for expanding the production of apricots on commercial scale with a view to obtaining a sizeable share in this large international market. A detailed plan of development programme on the lines suggested for peaches requires to be evolved in respect of apricots as well.

[23/] Basic Statistics on Fresh Fruits and Vegetables of Survey Countries, Volume III, Table A-2.

B. Processed Apricots

Production

Apricots enter international trade mainly in canned, dried or pulped form. Nectar and jams are relatively of less significance.

World output of processed apricot items is estimated at 400,000 tonnes. Canned apricots, as the following table indicates, account for 40% of the total production. USA is the world's leading producer followed by Spain and South Africa.

Production of Canned Apricots in Selected Countries [24]

(Tonnes)

	1964	1965	1966
United States	105,998	104,978	102,367
Spain	20,257	24,031	22,440
South Africa	13,872	22,032	20,155
Australia	9,037	16,279	13,525
Italy	1,489	2,489	2,795
Canada	3,652	2,142	2,142
Total	154,305	171,951	163,424

Data relating to the manufacture of apricot nectar and jams are not separately available.

World Trade

International trade in processed apricot items is estimated at 150,000 tonnes, major share of which is accounted for by canned fruit and pulp in bulk.

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[24] The Almanac of the Canning, Feezing, Preserving Industries, Chicago, 1967.

Imports into Survey countries between 1964 and 1966 were as given below:

Imports of Processed Apricot items into Survey Countries 25/

(Tonnes)

	1964	1965	1966
UK	26,000	30,300	34,400
West Germany	NA	NA	23,422
Belgium-Luxemburg	NA	5,109	9,008
Netherlands	NA	5,736	5,238
Sweden	1,554	2,025	2,315
Total	27,554	43,170	74,383

UK and West Germany absorbed a major proportion of the European imports in 1966 amounting to over 57,000 tonnes. Apricot pulp is reported to be the main item of imports. Supplies originate from Spain and Greece, in the main, and USA and South Africa to a lesser extent.

Prices. Average c.i.f. prices of canned apricots and apricot pulp in the West German market during March 1968 were as follows: 26/

Source of Supply	Pack size	C.I.F. Price ($ per case)
Canned Apricots		
South Africa, 'Choice' 'GOLD REEF'	24-1 lb	4.75
South Africa, Substandard 'EASTERN PRIDE'	24-2½	5.02
Spain, Apricot halves 'PRESTIGE'	24-2½	4.75

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25/ Basic Statistics on Processed Fruits and Vegetables of Survey Countries, Volume IV, Table B-2

26/ Ibid

Source of Supply	Pack size	C.I.F Price ($ per case)
Spain, Apricot halves 'MUNIBA'		4.20
Rumania, Apricot halves in heavy syrup	12-2½	2.28
Bulgaria, Apricot halves in heavy syrup	12-2½	2.03
Greece, Apricot halves in syrup 'VEKO'	24-2½	4.84
Apricot Pulp		
Spain, Golden 100% pure 'ROTESS'	6/5 kg	4.50
Spain, Semi-Golden 100% pure 'DAMANTE'	6/5 kg	4.10
Morocco, Extra Golden 100% pure 'SICOM'	6/5 kg	5.60
Spain, Golden Bulidas 90-95% pure 'MIRA'	6/5 kg	5.54

India's Position

Canned apricots and apricot jam are the main processed items produced in India. During 1966, total output was estimated at about 200 tonnes.

Export prospects for apricot products largely depend upon the extensive cultivation of this fruit in the country.

6. PLUMS

A. Fresh Plums

World Production

Countries of Eastern Europe dominate the world in the production of plums and prunes. Yugoslavia is the world's leading producer, closely followed by Romania and USA. During

1966, world output of plums and prunes was of the order of 3.7 million tonnes.

Production of Plums & Prunes in Selected Countries[27]

(Thousand Tonnes)

	1963	1964	1965
Romania	663	318	695
U.S.A.	522	657	615
West Germany	607	309	438
Yugoslavia	776	760	399
Hungary	192	242	243
Bulgaria	267	152	191
Total(incl. others)	4,455	3,544	3,783

Varieties. The cultivated varieties of plums are drawn from two sources, the European varieties (Prunus domestica) and the Japanese varieties (Prunus salicina). Wickson, Kelsey, Santa Rosa, Burbank, Gaviota are some of the important Japanese varieties. Preferred European varieties are, Belles de Louvain, Czars, Monorch, Prune D' Agen and Pozegaca.

Seasons of Harvest. Plums are generally harvested between July and September in Europe while in South Africa, they mature for picking between December and April.

World Trade

Compared to world output, international trade in fresh plums appears to be limited. During 1966, about

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[27] Production Year Book, FAO, Rome

447,000 tonnes of fresh plums entered the world trade, which in fact, was mostly in the form of intra-European exchanges. West Germany was the biggest importer with a volume of 10,800 tonnes. UK was next in importance with 8,900 tonnes. Most of the European countries import or export plums depending upon the seasons of harvest in the various regions.

India's Position

Production of plums was estimated at 11,240 tonnes during 1961-62, they are mostly utilised in fresh form.

B. Processed Plums

Among the main processed items prunes (dried plums) and spirits (main plum brandy) appear to bethe most important products. In Yugoslavia, for instance, 79% of the total crop was utilised for the production of spirits in 1965.

No data are available on the international trade in plum products.

India's Position

Plums are utilised for the preparation of jams and preserves in India. During 1966, production was estimated at 50 tonnes, comprising 20 tonnes of canned fruit and 30 tonnes of jams.

Prospects

Considering that Europe is almost self-sufficient in plum production, and that production of this fruit in India is yet to reach any sizeable proportions, prospects for exporting this item, in the fresh or processed forms, appear to be rather limited.

C. RECOMMENDATIONS

An overall review of the deciduous fruits industry in India clearly establishes its relative lack of growth and ability to sustain any sizeable export in fresh or processed forms. On available indications, the potential for accelerated development of this industry in the country is, however, quite bright. Certain over riding considerations also underline the need for rapid development of this industry. These are:

(a) The soil and climatic conditions available in several regions - both in hills and plains - are recognised as eminently suitable for production of a variety of deciduous fruits.

(b) The cultivation of selected deciduous fruits with the aid of optimum inputs and on a scientifically planned basis could be more profitable. In terms of higher yields per input this would also lead to better utilisation of land, diversification in production, and general improvement in the levels of economic development of the regions concerned.

(c) For a variety of deciduous fruits, particularly apples, peaches and apricots, both as fresh and processed, ready markets are available for exports. U.K. and West Germany and to a lesser extent other European countries offer vast scope for exports.

On the strength of these considerations, especially in view of the distinct possibilities of developing a viable deciduous fruits industry in India, it is recommended that high priority should be accorded to the rapid expansion of this sector. In evolving a planned programme of development of India's deciduous industry, it would be necessary to identify suitable areas of cultivation and processing, investigate measures undertaken by selected leading world suppliers in the fields of production and export marketing and examine the need, if any, and explore securing services of experts under an appropriate scheme of assistance.

(i) As a first step, comprehensive feasibility study should be undertaken to analyse the soil and climatic conditions of all prospective regions in relation to individual varieties of fruits that need to be grown, to investigate the economies of initiating cultivation in selected areas, to establish the feasibility of parallel development of processing industries, and to identify the infrastructure to be created and the inputs to be ploughed in. The feasibility study should embrance medium and long term requirements and prospective for extended development, on the other.

(ii) On the basis of the findings of the feasibility study, a blue-print should be drawn up for the promotion of deciduous fruits industry in India. It would be necessary, in this regard, to take notice of the levels of development achieved by the industries of major deciduous fruits growing countries. An intensive study of the organisational structure productive efficiency and marketing apparatus of the industry in Spain. Italy and U.S.A. is particularly recommended. This effort would enable India to plan the development of this industry with minimum scope for built-in viability and competitiveness.

(iii) It is suggested that India should seek the assistance of the Food and Agriculture Organisation for securing services of a group of specialists including a horticulturist, soil scientist, entomologist, fruit technologist and fruit engineer with a view to conducting feasibility studies in India for the development of peach and other deciduous fruit industry. Alternatively, services of horticultural technologists could be sought from major producing countries like USA, Italy and France.

4.8 OTHER FRUITS

Avocados, melons, papayas, guavas and chickoos (sapota) have been studied under 'Other fruits' India's prospects for exporting these items are indicated in this section against the background of world production and trade, wherever available.

1. AVOCADOS

Background

Commercial production of avocado pears (Peresa Americana Mill) which originally started in California and Florida in the beginning of the present Century has since spread to many other countries. It is cultivated extensively in Israel, South Africa and Martinique, and to a lesser extent in Brazil, Argentina, Chile, Cuba, Jamaica and Kenya.

Though avocados produced in many of these countries are mainly utilised for domestic consumption, in recent years, Israel followed by South Africa has made a successful attempt to introduce this exotic fruit into European markets. The success of their venture has prompted many Asian and African countries to produce this fruit for developing export markets in the temperate countries of Europe.

Production

Except for a few major producing countries, production estimates of avocado pears on a global scale are not available. USA is the largest producer of avocados in the world and had an average output of 60,000 tonnes during 1964-66 period. In Israel, production of avocados increased from 2,500 tonnes in 1965 to 3,400 tonnes in 1966. South African production is estimated to range between 6,000 to 7,500 tonnes per annum.

Information relating to avocado industry in California and Israel is given in Annexures G-1 and 2, in order to indicate the production and development trends that are taking place in these two important producing countries.

Varieties. Of the innumerable varieties and hybrids, only three are important from the point of international trade. They are: Fuerte, the large green fruit which starts off the avocado season; Haas, which has rough purple skin and smooth creamy flesh and Ryan, the small light green coloured fruit. Other important varieties are Ettinger, Booth 7 and 8, Pollock and Carlsoad.

Seasons. In USA avocados are grown round the year. In South Africa the season of availability extends from April to October, while the harvesting being in October and ends in May in Israel. From the international trade view point therefore Israel and South Africa are in almost perfect seasonal juxtaposition.

World Trade

World trade of avocados is mainly directed towards European countries which do not grow them. At present, Israel, South Africa and Martinique dominate European markets, although negligible quantities are also exported by West Indies, Kenya, Chile and Cuba.

UK, France and West Germany are the three main importers of avocados. During 1966, U.K. imported about 1,000 tonnes, France 821 tonnes and West Germany about 60 tonnes.

Trade circles in Europe believe that avocados are on the verge of becoming a popular fruit in view of the rapid lowering of the prices by the major exporting countries. Wholesale prices in Europe have decreased from $ 0.54 to $ 0.30 per piece between 1962 and 1966, and importers anticipate that there will be a further slump in prices when the new plantations in Israel and South Africa will come to bear in the next few years. Importers therefore anticipate a total market size of 10,000 tonnes per annum by 1970-71 on the basis that avocado consumption in Europe will reach a level of 50 gms. per capita by that year.

Avocados are usually packed in single layer trays, 18" long and 12" wide. Each fruit is wrapped in tissue or cellophane paper surrounded by wood wool. Fruits are air-freighted or sent by refrigerated ships at 45°F to 50°F depending upon the varieties.

Prospects for India

Avocado cultivation and production is still carried on an experimental scale in India. There are only a few fruit bearing trees in some of the horticultural research stations in the South. There is however no organised production of this item in the country.

Keeping in view the import potential of the European markets, it may be profitable for India, in the long run, to produce and export this tropical fruit. A programme of development, in this connection, would imply i) selecting suitable areas in the country for extensive cultivation of avocados, ii) conducting varietal tests with a view to pitching upon the most appropriate strain, and iii) evolving an adequate marketing programme. For this purpose, it may be worthwhile considering securing the services of a technical expert from FAO, or alternatively, arrangements could be made for getting Indian personnel trained in this field in California, USA, or in Israel.

2. MELONS

Background

Melons are grown in almost all the continents of the world. The volume of international trade in melons is, however, small as a majority of the production goes in for indigenous consumption. Very few countries like Spain, Italy and Israel have an export-oriented production base for melons.

World Production

Data on world production of melons are not available. Only very few countries have built up statistics of production, though separate data on water melons and musk melons are not classifed separately.

According to available information, U.S.A. is the largest producer of melons in the world. Water melons are estimated to account for a fairly large part of the total production. In Europe, Spain is considered to be the largest producer of melons at present, closely followed by Italy. Other important European producers comprise Bulgaria, Hungary, France, Portugal and Holland. (Melons are mainly grown under glass in Holland).

The other melon growing countries of the world are Cyprus, Israel, South Africa, Argentina and Chile. Though data on production of melons are not available, India can be classified as a major producer of melons in the world.

Data to the extent available, on production of melons in different countries of the world are given below.

World Production of Melons[1]
(Average of 1961-66)

(Thousand Tonnes)

Spain	875
Musk Melons	615
Water Melons	260
Italy	890
Musk Melons	270
Water Melons	620
Hungary	150
Musk Melons	30
Water Melons	120

Contd...

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[1] Source: International Fruit World, Vol. 3, 1967.

	(Thousand Tonnes)
Bulgaria	345
France	145
Portugal	25
Holland	5
Argentina	45

Varieties. Melons are of two types - water melons and musk melons. Water melons are large and oblong or globular in shape weighing on an average 4 to 5 kg each. Musk melons are smaller than water melons and their weight varies from 2 to 4 kgs per fruit.

Both water melons and musk melons figure in international trade. Water melons are, however, relatively less important as their weight is a hindrance for handling and transport. Their rate of damage during transit is placed between 10 to 20%. Even quality-wise, musk melons are considered superior in terms of taste and fetch double the price of water-melons in international trade.

Among musk melons, the Honey Dew varieties are the most popular. Ogen, a variety recently introduced by Israel, is also becoming increasingly popular in Europe. The other important variety from the standpoint of international trade, is known as Charentais which is regarded as the aristocratic variety among musk melons. Other musk melons entering international trade belong to Tiger, Net, Pineapple and Canteloupe varieties.

Season. While melons are available throughout the year, the peak period in international trade begins around middle of July and supplies are more or less regularly available from different countries upto early January. In February, supplies come from the Latin American countries which continue upto the former half of March. It can, therefore, be inferred that shortages of melons in international markets exist only during the April-June period, as the supplies available during these months fall far short of the potential demand.

World Trade

Exports. The following table below gives an idea of the quantities exported by the principal melon growing countries[2].

(Thousand Tonnes)

	1961	1965	1966
Spain	19.3	47.1	N.A.
Hungary	13.6	28.7	28.3
Chile	8.2	19.5	22.3
Italy	6.5	15.7	20.8
United States	50.8	15.3	14.8
France	1.5	2.9	3.6
South Africa	2.4	1.7	-
Israel	2.9	0.9	0.9
Holland	2.0	1.2	0.9

The above data highlight the decreasing importance of USA on the one hand, and the growing significance of Spain, Hungary, Chile and Italy. USA has since recent years become a net importer.

Imports. The major markets for melons are U.K., U.S.A., Canada, France, West Germany and Switzerland. Data on imports of melons by these countries are provided below[2].

(Thousand Tonnes)

	1961	1965	1966
U.K.	27.0	42.6	40.2
U.S.A.	70.3	122.9	19.0
Canada	17.2	17.5	17.2
France	2.6	9.1	12.1
West Germany	2.7	8.1	9.6
Switzerland	2.8	4.5	5.0

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[2] International Fruit World, Vol. 3, 1967.

Prices. The average c.i.f. prices of melons during the peak season was reported to be about $ 0.20 per kg. However, the prices vary considerably depending upon the quality of the fruits and even the best quality, during the season fetch around $ 0.40 to 0.50 per kg. The off-season (April-June) prices are much higher and first rate fruits reportedly secure $ 0.60 to 0.80 per kg.

Prospects for India

India's exports of melons, if any, have been negligible. No concerted efforts have been made to export melons in a systematic manner. The Survey reveals that India can have an excellent market for melons in the European countries. As the demand is mainly for musk melons in these countries, India should concentrate on exports of this variety. To begin with, attempts should be mainly directed at U.K., West Germany and France, the largest importers in Europe. Additionally, the Swiss market can also be explored profitably. As the Indian harvesting season begins from late March, attempts to export this item should be made between April and June, the off-season period for melons in Europe.

Particular attention should be devoted for grading and packing of fruits since the trade in Europe is attracted to well graded, uniform packs. Most of the Spanish honey dew melons are packed in shallow wooden cases of 20 kg capacity, though the trend is in favour of utilising fibre board cartons. The Survey revealed that musk melons are wrapped individually in tissue paper and then packed in card board cartons for export. The weight of the carton with fruits is normally 20 kg. Grading is done on the basis of number of fruits per standard carton of 20 kg that is 6, 8, 10, 12 or more per carton. Packaging according to the requirements of the markets is also important in view of the susceptibility of the fruit to damage in transit.

If effective steps to promote exports of Indian melons are taken, on the lines suggested above, it is considered that an export of 2,000 tonnes can be achieved by 1975-76. It is therefore suggested that in the initial stages trial consignments should be sent to the key points in U.K., West Germany, France and Switzerland by the State Trading Corporation to test the acceptability of Indian melons.

3. PAPAYAS

Background

Papaya (Carica papaya L.), a fruit native to tropical America, is now commonly grown in many parts of the world. The fruit is mostly consumed in the fresh form, although in recent years it is being increasingly utilised for processed items like papain and pectin. Other papaya products include candies, pre serves, jams, jellys and dried products such as cereals and papaya powder.

A Fresh Papayas

Production

Data relating to world production of papayas are not available. Significant producers of this fruit include USA, Spain, South Africa, Kenya, Congo, Tanzania, Uganda, Ceylon and India.

Varieties. Washington and Honey Dew are the most popular varieties in international markets. Other varieties of papayas grown include American, Giant, Mammoth, Philippine, Rhodesia and Sheffield.

World Trade

Belgium, Switzerland, West Germany and France are the important papaya importers in Europe. The Survey estimates the present market size in Europe at 350 to 450 tonnes per annum. Major supplying countries of papaya are USA, Spain and South Africa; Washington and Honey Dew are the popular varieties in demand in these markets because of the handy size of the fruits (½ kg to 1 kg in weight) and succullent orange-yellow flesh. The cif prices quoted for fresh papayas ranged from $ 0.50 to $ 0.70 per kg. during February-March, 1968 in European markets.

Being a very delicate fruit, papaya is packed very carefully for export. The fruit is wrapped in tissue paper and then placed in individual compartments of the cardboard carton with wood wool padding. Fruits are mostly air-freighted by the leading suppliers.

India's Position

Papaya is one of the most common fruits grown throughout India, though occupying relatively a small area. Between 1961-62 and 1965-66, the total area under the crop remained around 6,000 hectares. Production, on the other hand, had declined from 228,000 tonnes to 176,000 tonnes during the period, mainly on account of lower yield per hectare[3].

	Area	Production (Thousand Tonnes)	Yield per hectare (Tonnes)
1961-62	6,000	228	38
1962-63	7,000	232	35
1963-64	7,000	236	36
1964-65	6,000	192	35
1965-66	6,000	176	32

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[3] Directorate of Economics and Statistics, Ministry of Agriculture, New Delhi

Uttar Pradesh is by far the leading producer of papaya, accounting for one-third of the total output, followed by West Bengal, Assam, Gujarat, Bihar, Maharashtra and Madhya Pradesh, production ranging from 12,000 to 80,000 tonnes per annum. Important varieties of papaya grown in different regions are as follows.

Western Region : Washington, Honey Dew and Gujarati

Southern Region : Washington and Honey Dew

Eastern Region : Washington, South African, Ceylonese (Round), Honey Dew and Ranchi

Northern Region : Saharanpuri Selections, Honey Dew and Washington

Papaya is available in India throughout the year, though in the hilly regions they are harvested from February to May and in warm Deccan climate during July-February.

Prospects for India

India has not exported papayas so far. But in view of the large production-base available and the fact that internationally popular varieties like Honey Dew and Washington are already being grown in the country, it is considered that if adequate steps are taken exports can be initiated. Important aspects to be considered in this respect are:

(a) procurement of suitable fruits of the right maturity, that is when fruits are almost ripe but not fully ripe;

(b) evolving of suitable packages for protecting the fruit in transit;

(c) air-freighting of fruits on a regular basis to the key centres in Europe such as Frankfurt, Geneva Paris, Brussels and London.

It is envisaged that India will be able realize an export of 100 tonnes by 1975-76 if the steps outlined above are implemented.

B. Processed Papayas

Background

Though mainly consumed in the fresh form, papaya fruit can be used for the preparation of candies, preserves, jams, jellys and dried products such as fruit cereals and papaya powder. Papain and pectin - products of papaya are, however, by far the most important from commercial and export point of view.

Papain is the dried latex of papaya fruit, which finds use in food industry, especially for tenderising meat, chill-proofing of beer and in the manufacture of chewing gum and chocolates. It is also used in the pharmaceutical industry. Pectin of good quality can be obtained from papaya fruits, even after tapping them for papain. Pectin is an important chemical constituent in the manufacture of jams and jellys. Papain and pectin have gained importance in the world trade owing to their industrial significance.

World Trade

Ceylon, East Africa and Congo are the main suppliers of papain to the international markets. Exports of papain from these countries during recent years averaged at $ 1.5 million per annum. Though India is a large producer of papaya, she has not so far manufactured and exported papain and pectin.

The following table outlines data of exports on papain of major producing countries[4].

Quantity: Thousand Tonnes
Value : Thousand Dollars

	Ceylon		East Africa		Congo	
	Quantity	Value	Quantity	Value	Quantity	Value
1958	73	528	77	588	98	482
1959	138	642	87	395	153	487
1960	109	358	78	280	196	574
1961	35	132	76	333	1	3

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[4] Foreign Trade Statistics of Ceylon, East African Countries and Congo.

	Ceylon		East Africa		Congo	
	Quantity	Value	Quantity	Value	Quantity	Value
1962	31	157	59	339	65	322
1963	51	364	148	946	32	162
1964	83	596	259	142	-	-

The Central Food Technological Research Institute (CFTRI) has done considerable research work on the possibility of producing papain and pectin in India, and is in a position to provide necessary technical know-how for setting up manufacturing units on a commercial scale. The scheme formulated by CFTRI envisages a production of 4 tonnes of papain and 12 tonnes of pectin using papaya produced in a 35 acre plantation over a period of three years. Such a unit would be economically viable and involve a capital outlay of Rs 2.08 lakhs. The salient features of the scheme are indicated in Volume II, B-14, of the Report.

Prospectsfor India

In view of the export prospects of papain, concerted efforts require to be made to develop this industry on a priority basis. This will involve (a) a plannted programme of raising papaya plantations in selected areas, (b) setting up units for manufacture of papain, pectin and papaya products in their vicinity, and (c) taking effective measures for entering the world markets.

Market Surveys should be undertaken in Western Europe, especially in France, West Germany and Switzerland with a view to determining the extent of demand for papain and pectin, and the prospects for Indian exports.

4. GUAVA

A. Fresh Guava

Background

Guava[5] (Psidium guava) is a delicious fruit rich in nutritional contents such as vitamin C, calcium and phosphorous. It is grown in many tropical countries, notably Colombia, Coasta Rica, West Indies and French West Africa. No data, however, are available on the production and trade of this item in respect of these countries.

India's Position

Production of Guava, though widespread in India, is concentrated in the States of UP, Bihar, Madhya Pradesh and Maharashtra. These states together accounted for 70% of total production of 660,000 tonnes in 1961-62. Though no precise estimate of production in recent years is avaialble, it was reported that considerable expansion of area has taken place in the main producing states.

Prospects for India

Guava, like many other tropical fruits, is unfamiliar to Western consumers. Discussions held during the Survey with the trade indicated that there are no immediate prospects of exporting fresh guavas to the western countries, though canned guava products hold out some promise. West Asian and South East Asian countries have also not evinced interest in this item.

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[5] Basic Information on Fresh & Processed Fruits and Vegetables for India, Volume II, A-11, of the Report.

B. Processed Guava

Guava is pre-eminently suited for processing, especially for the preparation of jam, jelly, juice and 'guava in syrup'. Canned guavas have a taste and aroma better than that of fresh fruits. Yet, only about 400 tonnes are being utilised annually for processing purposes. Bulk of the production continues to be consumed in the fresh form within the country.

Canned guavas and guava jelly were introduced in UK recently and received favourable response. Efforts will require to be made to step up exportsof these items to UK and explore new markets in Western Europe and West Asia.

5. CHICKOOS (SAPOTA)

A. Fresh Chickoos

Production

Chickoo (Acharas sapota) is an important fruit crop of the Deccan plateau, Western India and humid tracts of South India. Its cultivation has been developed on a commercial scale in Maharashtra, Gujarat, Andhra Pradesh, Madras and Mysore. In the north, its cultivation is limited to certain parts of West Bengal and western districts of Uttar Pradesh and Punjab.

Total area under the crop was estimated at 1,250 hectares in 1961-62. In recent years, there has been considerable expansion of areas under the crop in Billimora and Dehanu taluk of Gujarat and Maharashtra States respectively. In 1966, production in these areas alone has been estimated at 80,000 tonnes. As sapota provides yield for six months (Dec-May) and helps realize steady

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6/ Basic information on Fresh & Processed Fruits and Vegetables of India, Volume II, A-12, of the Report.

incomes, its cultivation has been preferred to mango, which has otherwise been the traditional fruit crop in these areas. Kalipatti is the most popular variety of sapota grown in this tract.

The entire production of sapota in the country at present is consumed in fresh form. Experiments conducted by CFTRI have shown that it can remain in good condition upto 40 days when stored at 32°F to 45°F. This fact is of significance from the point of view of exports of fresh sapota to distant countries.

Prospects for India

Considering that the range of fruits available in European markets during winter is limited and that affluent sections of the population in these countries may not be averse to trying exotic fruits, it would be worthwhile to introduce sapota as a typical speciality item in West European markets. This was the view expressed by some of the leading importers contacted during the Survey in West Germany and UK. In fact some traders evinced interest to receive a few trial consignments to test the marketability of this item. It has been suggested that chickoos may be packed in cartons of 2.5 kg, in single layers, each fruit wrapped in tissue paper and placed in a pouch. Depending upon the outcome of the trial consignments, prospects of exports trade can be determined.

B. Processed Chickoos

Trials undertaken by M/s Amul Dairies, Anand, have proved that chickoos are quite suitable for canning purposes. Canned chikoos, like the fresh ones, could prove to be a novel exotic item for the foreign palate.

Samples of canned chickoos distributed among the selected consumers and importers during the Survey have evoked some favourable response. While the consumers agreed that it could prove a novel item, they suggested that it was too sweet and a dash of lime juice may provide for the fruit the requisite acidic touch. Importers who tried canned sapota indicated their willingness to introduce this item in the European markets.

Considering that the initial consumer reactions were favourable and that modfication of the product to suit the European tastes would not be difficult, it will be worthwhile to introduce this item on a larger scale in the European markets. Test marketing of this item, in a few selected cities like London, Frankfurt and Stockholm may well pave the way for sizeable exports of canned chickoos.

4.9 ONIONS

Background

Onions represent the only item of fruits and vegetables where India figures prominently in world production and exports. Of the total Indian exports of fresh fruits and vegetables, onions currently account for as much as 86% in terms of value.

Dehydration is the most important form of processing onions, but world trade in dehydrated onions is far less compared to fresh onions. India has yet to take up dehydration of onions on any appreciable scale.

A. Fresh Onions

World Production

World production of onions steadily increased from 7.7 million tonnes in 1961 to 9.6 million tonnes in 1965. Production of onions is dispersed over a large number of countries, but Japan, USA, India, Spain and UAR (Egypt) represent five major producers accounting for nearly 60% of world production. Of the average world production of 8.8 million tonnes during the period 1961-65, shares of different countries were as follows:

Shares of different countries in World Production of Onions (Average for 1961-65)

	%
Japan	15
USA	13
India	13
Spain	10
UAR	7

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	%
Italy	5
Turkey	5
Poland	3
Pakistan	3
Others	26
	100

It must be mentioned, however, that half the production of Japan comprises green onions, while the entire production relates to dry onions in the case of USA, India, Poland and Pakistan. Statistics of most of the other countries do not specify whether the data relate to green or dry onions. Detailed data showing area under crop, production and yield in important countries for the period 1961-65 are given at Annexure H-1.

Yield. Average yield of onions per hectare during 1965 amounted to 32 tonnes in USA, 28 tonnes in Netherlands, 24 tonnes in Spain and 18 tonnes[1] in UAR (Annexure H-1). In comparison, average yield in India is considerably lower at 9 tonnes per hectare. However, within India, relatively better yields of 14-15 tonnes per hectare are obtained in Maharashtra and Gujarat. Average yield in different states in India are as follows:

Average yields of Onions during 1957-58 to 1961-62

State	Area (Hectares)	Production (Tonnes)	Yield (Tonnes/Hectare)
Maharashtra	21,740	308	14.2
Madras	13,248	143	10.8

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[1] Relates to the winter crop which accounts for about two-thirds of the output of UAR and which alone is important from the export point of view. Average yield corresponding to the total output of UAR is 10 tonnes per hectare.

State	Area (Hectares)	Production (Tonnes)	Yield (Tonnes/Hectare)
Andhra Pradesh	15,022	142	9.4
Gujarat	6,386	93	14.6
Madhya Pradesh	8,452	89	10.5
West Bengal	8,892	74	8.3
Mysore	13,708	71	5.2
Punjab	7,336	61	8.3
Others	22,798	121	5.3
Total	117,562	1,102	9.4

Source: Directorate of Marketing and Inspection, Nagpur

Seasons of harvest. February - May represents the off-season for most European countries, with the notable exception of Spain which produces onions almost round the year. UAR has two crops, one each in summer and winter, of which the latter alone is relevant from the export point of view; this partly coincides with the European off-season. India produces onions round the year.

World trade. Total world exports of onions averaged 973,000 tonnes valued at $ 72 million during 1963-65, representing about 10% of world output. It is significant that Netherlands, which accounts for only 2% of world production, is the largest exporter of onions, claiming a share of 20.3% of the total world trade, in terms of value during 1963-65. Quantity-wise, with a share of 16.3%, Netherlands is next only to UAR, which accounted for 17.6% of world exports during the same period. Spain and India are two other major exporters of onions accounting for 10.8% and 10.4% respectively of total exports in terms of quantity; their shares in terms of value, however, are lower at 7.1% and 8.2% respectively because of the lower unit values realized. While detailed export statistics are given at Annexure H-2, the following table shows the shares of important suppliers in world exports during 1963-65:

Shares of different countries in world exports of Onions (Average for 1963-65)

	Quantity %	Value %
UAR	17.6	18.2
Netherlands	16.3	20.3
Spain	10.8	7.1
India	10.4	8.2
Poland	7.3	6.8
USA	5.3	7.2
Italy	4.6	5.7
Hungary	3.7	3.0
Others	24.0	23.5
Total	100.0	100.0

Imports. UK, with average imports of 218,500 tonnes valued at $ 20.8 million during 1963-65, offers the largest market for onions, claiming a share of 23.3% in terms of quantity and 24.3% in terms of value of world imports. West Germany is a close second, its imports having averaged 185,800 tonnes (19.8%). Important among other importers are Ceylon, France, USSR, Singapore and Malaysia. Average shares of different countries in world imports during 1963-65 were as follows (Annexure H-3):

Shares of different countries in world imports of Onions (Average for 1963-65)

(Percentages)

	Quantity %	Value %
UK	23.3	24.3
West Germany	19.8	19.2
Ceylon	7.0	5.6
France	6.7	6.3
USSR	6.1	4.4
Singapore and Malaysia	4.1	3.7
Others	33.0	36.5
	100.0	100.0

The European markets are generally covered by Spain, Netherlands, UAR and a few East European and Latin American countries. India however, holds a dominant position in South East Asia, accounting for as much as 95% of the total imports of Ceylon and about 75% of the total imports of Singapore and Malaysia. This is mainly attributed to geographical proximity and quality preferences. Indian onions, particularly the 'Nasik' red variety, enjoy a distinct consumer preference in Singapore and Malaysia.

Prices

Prices of onions imported into individual markets vary considerably depending upon the source of import, reflecting not merely differences in quality but also the period in which a particular country is able to supply the commodity. For instance, the premium prices fetched by UAR and Italy in the West German market are attributable to a large extent to early (December - May) supplies from these countries. On the other hand, Chinese (Mainland) prices in Singapore and Malaysia, which are lower by over 40% as compared to Indian prices, must be considered purely political. Average prices of onions in some of the major importing countries during 1967 were as follows:

Prices of Onions in major importing countries in 1967

($/Tonne, c.i.f.)

Source	Market				
	UK	West Germany	France	Singapore	Malaysia
India	-	-	-	102	109
China (Mainland)	-	-	-	58	60
Netherlands	116	91	80	102	105
UAR	110	107	92	102	102
Spain	104	93	92	-	-
Italy	-	120	101	-	-
Poland	91	63	-	-	-

Prospects for India

India's efforts should be directed towards consolidating its position in Singapore, Malaysia and Ceylon. In Singapore and Malaysia, China has become a competitor to reckon with, having developed a variety of onions very similar to the Indian 'Nasik' variety, except that it does not have the same pungency yet. The Chinese grading is perfect and there are no complaints of underweight which has been reported to be a common feature with shipments from India. These are some of the factors India has to take into account in consolidating its present dominant position in this region.

In addition, India can hope to have a share of the European markets which offer considerable prospects during the off-season, February-May. UAR also has the advantage of being able to supply during this period. Besides, the preference in the European markets is distinctly for the mild flavoured medium bulbs, often known as Spanish onions, with peel golden-straw in colur and flesh absolutely white. Production of this variety of onions in India is very limited at present. Efforts should be made to identify suitable areas and develop production of this variety in India so as to exploit the off-season prospects offered by the European markets.

If the measures outlined above are acted upon, it should be possible to augment Indian exports of onions to 125,000 tonnes by 1970-71 and 150,000 tonnes by 1975-76.

B. Dehydrated Onions

World Production and Trade

Data on world production of or trade in dehydrated onions are not available. UAR, which exports over 5,000 tonnes, is believed to be the largest supplier of dehydrated onions to world markets. Bulgaria, Hungary and Rumania are important among other suppliers.

Industry in UAR

Onions are produced in UAR mainly as a summer crop in the Delta region, where they are usually interplanted with cotton, and as a winter crop along the Nile from Cairo to Aswan. While the summer crop, which consists mostly of the variety 'Behairy' is consumed locally, the winter crop, represented by the varieties 'Sahidy' and 'Giza No. 6', is grown mainly for export, whether as fresh or as dehydrated.

The origin of dehydration in UAR can be traced back to the forties when exports were of the order of 300 tonnes; as against this, exports of dehydrated onions from UAR are currently in excess of 5,000 tonnes. Output can be equated with exports, as domestic consumption is negligible.

There are two State-owned companies engaged in the production of dehydrated onions, Alexandria Dehydration Company and Nasr Dehydration Company situated in Alexandria and Sohag respectively, which are centres of concentrated production for fresh onions. Total investment of the two companies is believed to be of the order of $ 1.4 million, about 80% of it in machinery and equipment. The factories are working to near full capacity on three shifts. It must be noted, however, that the factories work usually only from January to September, utilizing the remaining three months for maintenance of the plant. Apart from onions, these factories also undertake dehydration of garlic and vegetables like potatoes, green beans, tomatoes and carrots. Onions, however, represent the principal item, accounting for more than 75% of the total production.

Cost of Production. Onions used for dehydration are generally the 'odds left out in the sorting of fresh onions for exports, which are available at relatively low rates of $ 27-30 per tonne. Roughly 10 tonnes of fresh onions are required to produce 1 tonne of dehydrated onions. Most of the operations in the factories are manual, contributing to a fairly high proportion of labour costs in the total cost of production. The finished product is packed in various sizes ranging from 7 to 30 kg, but the usual pack is 7.25 kg (16 lb) can/polythene bag, two such packs being placed in a carton. It has been reported that cost of packaging is on the increase in recent years; to counter this, efforts are under way to develop alternative packages which will be more economical. One of the factories visited during the course of the Survey has reported the following break up of cost of production.

	Cost of production %
Fresh Onions	44
Labour	27
Utilities	7
Depreciation	3
Packaging	15
Overheads	4
	100

Prices. Kibbled or unbroken onions are graded into 'extra' and 'standard' on the basis of colour, percentage of foreign matter present, powder content etc. Ungraded onions are used to make powder (employing a mesh of 0.05 mm fineness). It has been reported that 60-70% of the total output is realized as kibbled and the balance as powder. Current export prices (March 1968), together with specifications and packing details, are given below.

Description	Specifications	Packing	Export price f.o.b. Alexandria ($/Tonne)
Dehydrated kibbled onions standard grade	Free from foreign matter and chemicals; moisture content 6% maximum	a) In three-point soldered tins of 16 lb net each, 2 tins to a carton	661
		b) In polythene bags of 16 lb net each, 2 bags in a double board cardbox	627
Dehydrated onion powder-standard grade	Free running without SO_2 and/or any foreign matter, moisture content 5% maximum	In air-tight tins of 28/32 lb net each, 2 tins to a carton	456

Exports. Exports of dehydrated onions from UAR during the past few years are shown below, together with exports of fresh onions for purposes of comparison.

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Exports of Fresh and Dehydrated Onions from UAR

	Fresh		Unit Value	Dehydrated		Unit Value
	Quantity (Thousand Tonnes)	Value (Thousand Dollars)	($/Tonne)	Quantity (Tonnes)	Value (Thousand Dollars)	($/Tonne)
1960	168.3	6,788	41	5,573	1,363	244
1961	148.5	7,991	55	5,173	1,628	315
1962	156.8	12,059	75	6,961	4,115	590
1963	154.8	10,059	71	6,353	4,498	707
1964	174.6	11,553	66	3,139	2,108	673
1965	159.2	12,754	80	5,539	2,686	486
1966	146.6	11,690	80	5,019	2,478	495

Source: Federation of Industries in the United Arab Republic Year Book, 1967, Cairo.

These exports are directed to more than 20 countries of which UK, the traditional market, alone absorbs over 40% of the total, Netherlands accounting for a further 20%. Other important markets include West Germany, Switzerland and Italy. Exports of UAR to USSR amounted to as much as 1,388 tonnes in 1965, but there was a sharp decline to 86 tonnes in the following year. Direction of exports during the past two years can be seen from the following table.

Dehydrated onions - Direction of UAR Exports

Destination	1965		1966	
	Quantity (Tonnes)	Value (Thousand Dollars)	Quantity (Tonnes)	Value (Thousand Dollars)
UK	2,141	1,051	2,051	1,163
USSR	1,388	622	86	39
Netherlands	1,010	413	1,117	511
West Germany	232	118	249	132
Switzerland	222	121	228	125

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Destination	1965 Quantity (Tonnes)	1965 Value (Thousand Dollars)	1966 Quantity (Tonnes)	1966 Value (Thousand Dollars)
Cuba	188	189	-	-
Italy	145	78	155	89
Australia	68	34	110	52
Japan	40	16	286	114
Hungary	-	-	210	89
France	-	-	192	100
Belgium	-	-	73	39
Others	105	43	52	25
Total	5,539	2,685	5,019	2,478

Efforts in India

There are two modern units in India undertaking production of dehydrated onions, their output during the last five years being limited to about 50 tonnes per annum, mostly to meet Defence requirements, civilian demand for dehydrated onions being negligible. Efforts of these units to enter the export market have not proved fruitful because apart from the high cost of production, the product could not be brought to acceptable standards, particularly in respect of bacteriological count. This is largely attributed to the non-availability of adequate quantity of the right type of raw onions.

The first prerequisite for India to enter the dehydration field will therefore be to develop production of the suitable white variety of onions, which is not grown in adequate quantities at present. Maharashtra and Haryana are reported to be suitable for cultivation of this variety.

In 1963 the Central Food Technological Research Institute (CFTRI) prepared a scheme for setting up a dehydration plant with a capacity to handle 50 tonnes of fresh onions a day, envisaging an investment of Rs 4.2 million, details of which are given in Volume II, Table B-15. As early as 1962, a cooperative society in Nasik was reported to be planning the setting up of a dehydration plant (with a capacity of 4,000 tonnes in terms of dehydrated onions) in that area, but nothing has come out of it so far. It is understood that recently a private party in the same area has come up with a proposal for a unit with a capacity of 1,000 tonnes, involving German collaboration, though the progress remains to be watched. A third unit with a capacity of 400 tonnes is being planned in Haryana, which will have Bulgarian collaboration. Investment costs for these projects vary widely from Rs 2.3 million to Rs 7.0 million per-1,000 tonnes of dehydrated products.

Prospects for India

World demand for dehydrated onions is on the increase. UAR is contemplating expansion of capacity to meet the increased demand in the years to come. Prospects for India, which will be a new entrant in the field, however, appear to be reasonably good. This optimism is based on the fact that India compares favourably with UAR in raw material as well as labour costs. The problem of high packaging costs is engaging the attention of UAR, and this represents an area to which India also needs to devote special attention. Indications are that polythene bags, which will be more economical than tinplate cans, will be functionally adequate. It has been found during the course of the Survey that Egyptian exports of dehydrated onions are effected on the basis of Government subsidy to the extent of about 15% of the cost of production. This points to the possible need of some assistance in the case of Indian exports too. Further investigation of this will be possible after the dehydration units currently being contemplated have commenced production. It should be possible for India to export at least 2,000 tonnes of dehydrated onions by 1975-76.

C. Recommendations

The following specific measures are recommended for developing production and exports of onions, dehydrated as well as fresh:

(a) A technical study should be undertaken in Netherlands and Spain, from the point of view of fresh onions, and UAR and Bulgaria, on dehydrated onions, with a view to ascertaining the lines on which the onion industry in India needs to be developed.

(b) Feasibility studies should be conducted in India to select suitable varieties of onions, for the fresh market and for dehydration, and identify suitable areas for intensive cultivation of such varieties.

4.10 POTATOES

A. Fresh Potatoes

Background

Among the tuber and root crops, potatoes have acquired a significant place in the temperate countries in view of their importance as staple diet and industrial raw material. Their importance to international trade, however, arises owing to the fact that most of the potato producing countries, whether in temperate or tropical regions, depend upon external sources for their seed requirements. World trade in seed potatoes consequently is of greater importance than trade in ware potatoes. In fact, if the intra-European trade in ware potatoes are excluded from the world trade purview, trade in consumption potatoes in relation to world production, will be less than one per cent. Witn the discovery of 'New Potatoes', international trade in potatoes is gradually gaining ground and even countries outside Europe are attempting to supply this 'new found delicacy' to the Western markets.

World Production

Europe leads the world in the production of potatoes. During 1965, European countries accounted for 85% of the total world output of potatoes. USSR and Poland were the most important producing countries with a share of 40% and 20% respectively in the European production. Other significant producing countries in this region include East Germany, West Germany, France and U.K.

USA was the single important producer in Americas, while Japan, India, North and South Korea and Pakistan were the major producers of the Asian continent. Details relating to world potato production are furnished at Annexure I-1 and a summary is presented below:

Production of Potatoes in Selected Countries

(Million Tonnes)

	1963	1964	1965
USSR	71.8	93.6	87.9
Poland	44.8	47.8	43.9
Germany, West	25.8	20.6	18.0
USA	12.3	10.8	13.1
Germany East	12.8	12.8	12.8
France	15.9	11.5	11.2
UK	6.6	7.0	7.5
Japan	3.4	3.9	4.0
India	3.3	2.5	3.6
Netherlands	3.8	4.1	3.2
(Total including others)	284.5	297.7	284.2

Varieties: There are a large number of commercial varieties of potatoes grown in different parts of the world. The commonly grown varieties in Europe include:

Earlies: Ersteiling, Cresus, Sirtema

Semi-earlies: Bintje, Gaumaise, Levi (yellow) fleshed varieties)

Semi-late varieties: Electre, Patrones, Record (Yellow fleshed varieties)

Late varieties: Ackersegen, Gari, Varan (yellow fleshed varieties)

Arran Banner, King Edward, up-to-date, Royal Kidney (white fleshed varieties).

Yields: World average yield for potatoes was estimated at 12 tonnes during 1965. Average yields in different countries, however, ranged from 26 tonnes in Netherlands, 23 tonnes in West Germany, 19 tonnes each in France and Japan, 12 tonnes in Lebanon, 10 tonnes in USSR to about 7 tonnes in India.

World Trade

World trade in potatoes, as compared to total world production has always been quite negligible. It was reckoned at 3.4 million tonnes valued at $ 211.4 million during 1965 with were potatoes accounting for 2.8 million tonnes ($ 164.8 million) and seed potatoes for the reminder ($ 46.6 million). The netherlands was by far the leading exporting country followed by Poland and France. A major proportion of the world supplies was absorbed by West Germany, Czechoslovakia, Italy and Spain. Import and export data relating to world potato trade are given at Annexures I-2, 3, 4 and 5.

West Europe: Apparent consumption of potatoes between 1964 and 1966 in the Survey countries of West Europe may be estimated at 57.3 million tonnes with a balancing import and export volume of 1.8 million tonnes.

Apparent Consumption of Potatoes in the Survey Countries of West Europe[1]

Quantity : Million Tonnes
Value : Million Dollars

	1964-66 average	
	Quantity	Value
Production	57.3	-
Imports	1.8	145.7
Exports	1.8	113.9
Apparent Consumption	57.3	
Apparent per capita Consumption (in Kgs.)	96.1	

In terms of value, there was an imbalance in trade accounting to $ 31.6 million during the corresponding period. While the Survey countries supplied seed potatoes to the other parts of the world, their main imports comprised ware potatoes and, in recent years, new potatoes. Imports into these countries take place during the spring season, that is before the home-grown supplies arrive in the market.

West and South East Asia: Hong Kong, Singapore and Malaysia in South East Asia, and Iraq and Kuwait in West Asia depend mainly on imports for meeting their potato requirements. Their annual average demand is estimated at 86,000 tonnes. Taiwan, Australia and Netherlands are among the major suppliers to the South East Asian markets while exports from UAR and Lebanon are directed towards the West Asian markets. South-East Asian countries import mainly the yellow fleshed varieties while the West Asian markets prefer white fleshed tubers.

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[1] OECD Commodity Trade Statistics and Volume III, Table A-1.

New Potatoes

In recent years, there has been a perceptible shift in the European consumer preference for potatoes. 'New' or 'Early' potatoes are becoming popular while the demand for ware potatoes are definitely on the decline. Potatoes are generally called 'New' when the tubers have been harvested immature, that is even before the skins have set and haulms are green. Normally, they are produced from rapid growing varieties which permit the early lifting of a large number of small tubers. Because of their immaturity, new potatoes are reported to be very delicate and extremely susceptible to injury during harvesting and shipment.

In view of their highly perishable nature, trade in imported new potatoes is regarded as being highly speculative, but nevertheless an increasing number of countries are competing for a share in the European markets. At present, major suppliers are Cyprus, Spain, Canary Islands, Israel and Morocco. New potatoes are mainly imported into Europe during February-July period.

Between 1964 and 1966, imports of new potatoes into Survey countries in Europe increased from 436,262 tonnes to 601,341 tonnes registering an average increase of 55,000 tonnes per annum, during the past three years. Indications are, that demand for imported new potatoes in Europe will continue at this level and possibly expand at a faster rate in the near future.

Prices

Import prices of new potatoes are reported to be usually higher by 10% to 15% as compared to the prices of ware potatoes. While the average c.i.f. price in U.K. for ware potatoes was around $ 1.50 per bag of 25 kg. during 1957, new potato price during the same time, was reported to be about $ 2.5 to $ 3.0.

Seasonal New Potato Prices in UK During 1967[2]

(Per bag of 25 kg in Dollars)

	May	June
Cyprus	3	2.5
Spain	3	3
Cavary Islands	3	3
Morocco	3	-
Israel	2.5	-
Channel Islands	4.5	3.5

Position in India

Production. Production of potatoes in India is receiving increased attention in rectn years. The area under the crop has ranged between 41,0,000 to 4,70,000 hectares during 1962-63 to 1966-67, while annual production averaged at 3.5 million tonnes during the corresponding period. A massive potato production programme has been contemplated by the Government of India, which envisages raising the area to one million hectares and the yield to 12 million tonnes by 1970-71.

2/ Field Survey

Area, Production and Average Yield per Hectare of Potatoes in India 3/

	Area (Thousand Hectares)	Production (Thousand Tonnes)	Average Yield (kg per Hectare)
1962-63	413	3,363	8,152
1963-64	415	2,593	6,249
1964-65	431	3,668	8,516
1965-66	480	4,060	8,455
1966-67	471	3,462	7,348

Major areas of concentration are found in UP, Bihar, West Bengal and Assam. Statewise distribution of area and production are furnished at Volume II, Annexure A-18 of the Report.

Varieties. Phulva, Darjeeling Red and Gole comprise main potato varieties cultivated in plains of North India, Great Scot, Bencranchan, Late Carmen and Royal Kidney are the common varieties grown in Nilgiris, while Up_To-Dat and Magnum Borum are important varieties in Maharashtra and Gujarat.

Inadequate supply of seed potatoes for meeting the sowing requirements has been a major limiting factor for stabilisation and extension of potato cultivation in India. The Central Potato Research Institute, Simla, is reported to have effected a break-through in potato seed multiplication techniques which will make it possible to raise healthy seed stock even in sub-tropical plains. It is also claimed that the new seed potato will be completely free from soil borne diseases and that it can be multiplied at a faster rate. Extensive application of this technique is expected to assist in achieving the production targets mentioned above.

3/ Directorate of Economics and Statistics, Ministry of Agriculture, New Delhi.

Concurrently, it is also envisaged that India will be in a position to create substantial export surpluses of seed potato in the near tuture.

Prospects for India

Table Potatoes. Survey findings reveal that Singapore and Malaysia could be developed as potential markets for Indian potatoes. These markets prefer 'Bintje Claysoil' potatoes because of their yellowish colur of the flesh and fewer number of eyes. Potatoes are required to be oval in shape and big in size as they are mostly used for making chips. Average C.I.F. price quoted by Holland during 1967-68 was reported to be $ 2 per gunny bag of 25 kg. If India can tap these markets, it would be possible to build up a market of about 2,000 tonnes by 1970-71 and 5,000 tonnes by 1975-76.

Seed Potatoes. Considering that India will have disease-free seed stock for exports in the next few years, it may be worthwhile exploring foreign markets for this item. Opportunities in view of the fact that major producing countries in this region look for seed potatoes around January for sowing in March-April which India can offer this requirement.

B. Processed Potatoes

Crisps, canned peeled potatoes and dehydrated potatoes are the most important processed potato items. International trade in these items is negligible.

Canned peeled potatoes have since recently acquired a good deal of popularity in the European markets. Production of canned potatoes in UK, for instance, was estimated to have amounted to 5 million cans in 1965, 30 million in 1966 and 100 million in 1967. In Germany too, the trend seems to be in favour of canned potatoes. During 1967, total production was estimated at 10 million cans and the food distributors contacted during the survey indicated that the demand is on the up-swing. Canned potatoes were sold at $ 0.75 per 20 oz. can.

Potatoes in India are canned mainly to meet the defence requirements. Total production has been estimated at about 4 - 5 million cans.

Prospects. Demand for processed items, though may be on the increase will hardly figure prominently in the international trade. The trend so far has been to produce these items 'at home'.

4.11 TOMATOES

A. Fresh Tomatoes

Background

Among vegetable crops, tomato constitutes one of the most important commodities in respect of range of varieties grown and volume of production. Tomatoes are cultivated extensively in tropical and sub-tropical regions. USA, Italy, Spain, UAR and Bulgaria are the leading producing countries. Through application of scientific methods of cultivation (phenological surveys, varietal trials, mechanical harvesting, etc.), tomato production has been revolutionalised, notably in USA, France, Italy and Spain.

Besides consumption in fresh form, considerable quantities of tomatoes are utilised for the production of concentrates, juices, catsup and peeled tomatoes. In India excepting for about 2,000 tonnes of tomatoes utilised by the canning industry mainly for the production of catsup and juice, the entire output is consumed in fresh form. Though the varieties suitable for canning purposes are not currently grown in commercial quantities in India, it should be possible to cultivate them for developing a viable tomato industry with an accent on exports.

World Production

World production of tomatoes has shown an impressive rise from 16.8 million tonnes in 1961 to 19.4 million tonnes in 1965 (Annexure J-1). Though cultivation of tomatoes is widespread in different parts of the world, its production is concentrated in USA and Europe which account for over 70% of the world output as may be seen from the following table:

(Next page)

Production of Tomatoes in different regions in 1965 1/

Region	Production (Thousand Tonnes)	Share in World Output
North America	5,334	27.5
USA	5,070	26.1
Europe	8,443	43.5
Italy	3,177	16.4
Spain	1,330	6.9
France	588	3.0
Greece	548	2.8
Bulgaria	775	4.0
Romania	562	2.9
Netherlands	312	1.6
Others	5,618	29.0
UAR	1,242	6.4
Japan	532	2.7
Morocco	291	1.5
World Total	19,395	100.0

India with an estimated area of 41,000 hectares and a production of 464,000 tonnes accounts for about 4.5 per cent of world area and 2 per cent of world production. 2/

Varieties. Important commercial varieties grown in Europe include Early Marmande, Marmande Plate, Plate de Chateaurenard and Saint Pierre for table purposes and Roma and San Marzano for processing use. Characteristics of these varieties are indicated in Annexure J-2.

1/ FAO Production Year Book, 1966. Figures of Indian Production have not been shown in this source.

2/ Directorate of Marketing and Inspection, Nagpur

In recent years, varieties developed in USA have been introduced in Europe and are gaining importance. In India, several local varieties are grown which differ widely in their growing seasons, yields, quality and resistance to pests and diseases (Volume II, Annexure A-14).

Yields. Tomato is sensitive to ecological conditions but responds well to scientific methods of cultivation. Major producing countries like USA, Italy and France bestow considerable attention to the selection of suitable varieties, areas of cultivation and methods of production including judicious application of fertilizers and effective control of pests and diseases in order to achieve high crop yields. Average yields obtained in USA and France range from 30 to 35 tonnes per hectare,20 to 25 tonnes in Italy and Spain, and about 19 tonnes in Greece. The yield in India is estimated at 11 tonnes only.

Seasons of Harvest. Tomato is a short-duration crop and comes to harvest in four months from the time of sowing. Normally two crops are raised in a year, though in areas where fluctuations in atmospheric temperatures are not appreciable, it may be possible to raise three crops. In Europe, tomato is harvested mainly during June-September. In Italy, nearly 60 per centof total production is harvested during July-September, 20 per cent during October-December, 15 per cent during April-June and 5 per cent during January-March. In Spain, the peak period of harvest is between October-December in the mainland and January to April in the Canary Islands. In countries like Morocco, tomato is harvested during January-May. From the seasonal point of view, January-May should be regarded as the period of low supplies in the European markets.

World Trade

Data regarding international trade in tomatoes are not available but based on the export figures of major producing countries, the world exports can be estimated at about one million tonnes per annum, representing about 5 per cent of the world output. Italy, Spain, Netherlands, East European countries (mainly Bulgaria, Romania and Hungary) and Morocco are the major exporters. In Europe, West Germany (230,000 tonnes), France (175,000 tonnes), UK (165,000 tonnes), Scandinavian countries (29,000 tonnes) constitute major import markets. Germany imports two-thirds of its requirements from Netherlands, and about 20 per cent from Italy and Spain. Imports into UK are mainly from Spain and Porgugal, while French imports originate from Morocco, Spain and Spanish Morocco. The following table provides source-wise data on average annual imports of tomatoes in recent years in selected world markets (Volume III, Table A-2).

(Thousand Tonnes)

Supplying Countries/ Importing Countries	West Germany	France	UK	Switzerland	Scandinavian Countries	Others	Total
Netherlands	160	9	44	2	15	10	240
Italy	15	6	-	9	2	5	37
Belgium	3	5	-	-	-	-	8
Sapin (Canary Islands)	18	22	90	1	8	1	140
Spain (Mainland)	13	11	30	1	3	2	60
East Europe	17	-	-	1	2	10	30
Morocco	2	110	-	1	-	2	115
Others	2	12	-	1	1	1	17
Total	230	175	164	16	31	31	647

Kuwait imports annually about 10,000 tonnes of fresh tomatoes almost entirely from Jordan. Hong Kong (12,000 tonnes) and Singapore (7,500 tonnes) are supplied most by China (Mainland) and Taiwan.

Prices

January-May constitutes the off-season period in the European markets when supplies from Morocco, Canary Islands and Netherlands (hot house tomatoes) yield higher prices. For instance, as against about $ 15 per quintal (c.i.f.) paid for Italian tomatoes during the season, those from Netherlands and Canary Islands fetched between $ 24-30 per quintal in 1967-68 in the West German market. Average import prices (off-season) in France and UK, however ranged between $ 21.35 per quintal.

Prices paid for Jordanian tomatoes (c.i.f.) in Kuwait were around $ 60 per tonne while tomatoes from China (Mainland) and Taiwan fetched about $ 50 per tonne (c.i.f.) in the Hong Kong market, during 1967-68.

Over 50 per cent of Spanish winter tomatoes are annually exported to the UK market. In order to ensure even flow of supplies and obtain economic prices, Government of Spain has been continuing a system of allocation of weekly export quotas to the established exporters since 1966. The volume of weekly quota is so fixed as to ensure that prices fetched in the UK market for Spanish tomatoes are not less than Sh. 9 per case of 6 kg. The main feature of this system is that instead of imposing minimum export prices, the same effect is sought to be achieved by regulating the export supplies.

Prospects for India

Market opportunities for fresh tomatoes are limited. However, the demand potential for quality tomato products in the world markets is substantial. Given positive export orientation, the Indian tomato industry can emerge as a leading supplier.

B. Tomato Products

Background

The large scale production of fresh tomatoes in the world and the perishable nature of the crop has led to the establishment of a sizeable industry in tomato products in the major growing countries of the world.

Tomato products can be broadly classified under four groups: i) tomato concentrates; ii) tomato juices; and iii) tomato catsup; and iv) whole peeled tomatoes. Tomato concentrates constitute the leading most item among tomato products followed by tomato catsup, tomato juices and whole peeled tomatoes. The uses of tomato concentrates are varied. It constitutes an essential ingredient in a number of sauces, canned fish, processed beans and other related products. Consumption of tomato concentrates has been rising steadily over the years in view of the increasing popularity of tomato-based products in the world.

In USA, which constitutes the largest producer of fresh tomatoes in the world, 4.6 million tonnes of the aggregate production of 5.4 million tonnes were processed in 1966, thereby indicating 80% utilisation in the manufacture of different tomato products. Out of the total

Italian production of 3.5 million tonnes in 1967, 1.1 million tonnes were used by the processing industry, showing 31% disposal in processed form. There are, however, certain areas in Italy, where the processing industry has converted 80% of the fresh produce into tomato products. On an average, about 30% of fresh tomatoes grown in the world are estimated to be processed in one form or another.

World Production and Trade

In the world vegetable canning industry, tomato products occupy a dominating position, next only to peas and beans. Though production figures for the manufacture of processed tomatoes are not available, it has been estimated that during 1966 the production of tomato products in major producing countries was as follows:[3]

(Thousand Tonnes)

	1964	1965	1966
Tomato Concentrates	738.2	703.7	894.2
Tomato Juice	577.5	555.5	542.1
Whole Peeled Tomatoes	674.6	761.9	671.8
Total	1,990.3	2,021.1	2,108.1

The figures presented above include the production of tomato products in USA, Italy, Spain, France, Portugal, Greece and South Africa. The production data of Bulgaria and Hungary, the two important manufactures of tomato concentrates in the East European countries, are not available. The production of tomato pulp in Bulgaria and Hungary was however estimated at 50,000 tonnes and 25,000 tonnes respectively[4] in 1966. On an average 50 per cent of the production of tomato concentrates in these countries is exported. Production of tomato juices and peeled tomatoes in these two countries is not rep rted to be substantial. The following table presents data of production in the major countries[5]:

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[3] The Almanac of the Canning, Freezing, Preserving Industries, 1967, USA

(Thousand Tonnes)

	USA	Italy	Spain	France	Portugal	Greece	South Africa	Canada	Total
Tomato Concentrates									
1964	422.9	118.0	86.3	42.2	47.7	10.7	10.4	-	738.2
1965	339.4	118.0	108.5	43.0	72.0	12.3	10.5	-	703.7
1966	477.1	150.0	108.5	43.0	92.8	12.3	10.5	-	894.2
Tomato Juice									
1964	469.2	9.5	3.6	-	-	-	-	95.2	577.5
1965	436.3	11.0	4.9	-	-	-	-	103.3	555.5
1966	423.9	10.0	4.9	-	-	-	-	103.3	542.1
Whole Peeled Tomatoes									
1964	396.9	250.0	-	-	-	-	-	27.7	674.6
1965	395.9	320.0	-	-	-	-	-	46.0	761.0
1966	355.8	270.0	-	-	-	-	-	46.0	671.8

It would be seen that USA constitutes the largest producer of tomato products, accounting for over 50% of the aggregate production in the selected major countries of the world. She has been maintaining her dominating position since the Second World War, in view of the large production of fresh tomatoes and the existence of a sizeable tomato processing industry. In respect of tomato concentrates, the second position is held by Italy with a production of 150,000 tonnes, followed by Spain which manufactured 108,500 tonnes during 1966. Portugal has been steadily improving her position over the last three years, production having risen from 47,000 tonnes in 1964 to 92,800 tonnes in 1966.

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[4] Commodity Division, Commonwealth Secretariat, London

[5] The Almanac of the Canning, Freezing, Preserving Industries, 1967, USA

Whole peeled tomatoes are principally produced in USA, Italy and Canada; small quantities are however reported to be packed in some of the East European countries including Yugoslavia, Hungary and Bulgaria. Total production of preserved tomato wholes in USA, Italy and Canada was around 674,600 tonnes in 1964 marginally declining to 671,800 tonnes in 1966.[6] The fall is mainly accounted for by the decline in production in USA from 396,900 tonnes in 1964 to 355,800 tonnes in 1966. Production in Italy was almost stagnant around 250,000 tonnes during 1964-66. Canadian production, on the other hand, recorded a remarkable rise from 27,000 tonnes in 1964 to 46,000 tonnes in 1966.

Tomato juice was manufactured to the extent of 542,100 tonnes in USA, Canada, Italy and Spain during 1966. Single strength tomato juice is reported to be the most popular juice among canned single strength juices. Its bright colour, flavour and nutrient-filled appetizing quality account for its popularity among the world consumers. Though tomato juice is increasingly being

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6/ Commodities Division, Commonwealth Secretariat, London produced by a large number of countries, USA accounted for 78 per cent of production in 1966, followed by Canada (18%). It may however be indicated that the production of tomato juice declined in USA, from 469,200 tonnes to 423,900 tonnes between the years 1964-66 on account of the bad crop in California during 1965-66.

Besides tomato concentrates, tomato juices and whole peeled tomatoes, large quantities of tomato catsup are manufactured all over the world. While the major manufacturers of this product include USA and Canada, which reportedly accounted for 50% of the total world production, tomato catsup is increasingly being packed in most of the East and West European countries. These are being packed from concentrates, a technique now used all over the world. Statistics on the world production of catsup are not available. However, the output of USA and Canada has been estimated at 200,000 tonnes during 1966, USA accounting for over 90% of the total production. Other important countries producing catsup include UK, Italy, Spain, Yugoslavia, Greece, Hungary, Netherlands, France, West Germany and Sweden. It may however be indicated that catsup is mostly manufactured on the basis of imported concentrates coming mainly from Bulgaria, Portugal, Italy and Spain.

Imports (Survey Countries)

Analysis of imports statistics shows that approximately 237,564 tonnes of tomato products were imported into the Survey countries during 1965 comprising tomato concentrates (49%), whole peeled tomatoes (40%) and tomato juices (11%). In the absence of information and data for the preceding years, it has not been possible to indicate import trends. Available indications suggest that imports of tomato products have been steadily growing in these countries. Despite sizeable trading in fresh tomatoes, import of canned products in the form of concentrates and wholes continues to grow in the European countries. The Survey revealed that tomato concentrates have the highest growth potential among all the tomato-based products, both in the household and institutional sectors. Furthermore, increasing quantities of tomato-based canned vegetables and other tomato products like catsup are being locally produced all over Europe resulting in increasing demand for tomato concentrates.

The steady increase in the imports of tomato products with respect to the Survey countries and their relative importance can be seen from the table given below[7]:

(Thousand Tonnes)

	1966	1967
Tomato Concentrates		
UK	65.5	NA
West Germany	32.3	NA
Iraq	12.5	NA
France	4.0	11.3
Sweden	2.5	NA
Denmark	2.4	NA
Peeled Tomatoes		
UK	69.4	NA
Switzerland	14.8	NA
Belgium-Luxemburg	12.8	14.0
Netherlands	8.1	8.1

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[7] Basic Statistics on Processed Fruits and Vegetables of Survey Countries, Volume IV, of the Report.

	1966	1967
Tomato Juice		
UK	14.0	NA

Shares of different supplying countries in the imports of the Survey countries during 1966 were as follows:[8]

(Percentage)

	Portugal	Italy	Bulgaria	Canada	France	Others
Tomato Concentrates	34.2	30.7	4.6	-	-	-
Whole Peeled Tomatoes	1.9	66.1	11.9	-	-	-
Tomato Juice	-	17.4	-	34.9	36.8	6.4

Tomato Concentrates. It would be seen from the above that in the tomato concentrates market of Europe, Portugal occupies a significant position, supplying about 34% of the total imports in 1966, followed by Italy 31% and Bulgaria. In the opinion of the trade, Portugal has been steadily increasing her supplies to the European markets during the past three years mainly at the expense of Italy. Bulgaria too has improved her position considerably during the past few years and her share is expected to grow faster in view of the intensive efforts reportedly made by the Bulgarian exporters among the institutional consumers particularly in UK and West Germany. Bulgaria's exports of tomato concentrates to West Germany and Sweden in particular have been rising rapidly over the past three years mainly on account of her competitive prices as compared to other suppliers including Italy, Portugal and USA.

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[8] Basic Statistics on Processed Fruits and Vegetables of Survey Countries, Op.cit.

Whole Peeled Tomatoes. Peeled tomato market has always been dominated by Italy, which as seen above, controlled approximately 66% of the total market of the Survey countries of the order of 105,622 tonnes in 1965. Bulgaria has recently emerged as a major supplier of peeled tomato wholes to the European markets during the recent past, its share rising to 12% during 1966. Other suppliers included Portugal, Hungary and Spain.

Tomato Juice. Tomato juice, the import of which was around 14,950 tonnes in 1966, was mainly supplied by Canada, France, Italy and USA. Major share of the Survey markets was however held by Canada 39.4%, followed by France 37%.

Industry in Selected Countries

Tomato processing industries in selected Survey countries are reviewed briefly below:

Italy

Production. The total area under tomato crop in Italy has been estimated to be of the order of 131,000 hectares and the production of fresh tomatoes was around 3.5 million in 1967, showing an average crop yield of 26.9% tonnes per hectare. Almost 31% of the total Italian fresh produce is utilised by the processing industry, which is the second largest in the world, next only to USA.

Manufacture of tomato products, as estimated by the National Institute of Preserved Foodstuffs and Central Institute of Statistics, Rome, was 449,000 tonnes in 1966 as against 459,500 tonnes in 1965. Production was however expected to go down to 405,000 tonnes in 1967 thereby reflecting the declining trend in Italian production.

The production of different tomato products in Italy during the past three years is presented below:[9]

(Thousand Tonnes)

Item	1965	1966	1967
Tomato Concentrates	118	150	145
Peeled Tomatoes	320	270	250
Tomato Juice	9.5	11	10
Other Tomato products	12	16	16

Tomato processing units are mainly located in the PO Valley and Naples, the two most important tomato growing areas in the country. Naples, for instance, packs about 12 million cases (240,000 tonnes). While 50% of total production of tomato products is consumed locally, the demand for tomato concentrates especially is considered to be the largest in the country.

It is known that tomato concentrates are mainly manufactured in three grades: single, double and triple concentrates. While single concentrate has tomato content in the dry weight ranging between 24 and 26%, the double concentrate is around 28-32% and triple about 36%. Tomato concentrates are sold in various types of cans and packages ranging between 100 gms and 10 kg. They are also marketed in 100 gms and 200 gms tubes, accounting for over 50% of the local consumption.

Exports. Approximately 50% of the total production of tomato products is marketed abroad. Exports of the various products during 1964-65 and 1966-67 were as follows:[10]

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[9] National Institute of Preserved Foodstuffs, Rome

[10] Foreign Trade Statistics of Italy

(Thousand Tonnes)

	1963-64	1964-65	1966-67
Peeled Tomatoes	124.2	130.3	143.1
Tomato Concentrates	100.7	103.3	133.4
Tomato Juice	3.7	6.9	8.6
Total	228.6	240.5	285.1

Peeled tomatoes constitute the leading item among all the various products, exports rising from 124,265 tonnes in 1964-65 to 143,119 tonnes in 1966-67. Principal buyers of Italian peeled tomatoes include UK, USA and Switzerland, UK accounting for about 50% of the total exports of peeled tomatoes from Italy during 1966-67. It is understood that UK has been the largest buyer of Italian peeled tomatoes over the past five years.

Tomato concentrates were exported to the extent of 133,390 tonnes during 1966-67 indicating a rise of about 33% against total exports of 100,747 tonnes in 1964-65. Major buyers of concentrates include West Germany, UK, USA and Saudi Arabia, accounting for over 50% of the total exports during 1966-67.

In respect of tomato juice, exports of which more than doubled during 1964-65 and 1966-67, West Germany and UK constitute the main customers, together accounting for over 60% of the total exports over the period.

Mention has been made earlier that approximately 31% of the total Italian fresh tomatoes are converted into different products by the processing industry. The table given below presents the average prices paid by the canners to the farmers during 1964-67:[11]

(Lire/Kg)

Region	For Paste Use 1964	1965	1966	1967	For Peeled Tomatoes 1964	1965	1966	1967
Campania	22	21	16	22	45	35	27	38
Emilia	16	18	18	19	25	24	23	27

The price of tomatoes required by the paste industry in Campania remained stationary over 1964-67 except for a decline during 1966. In Emilia area, however, the prices steadily rose from 16 Lire to 19 Lire per kg, showing an increase of about 20% over the period. While the average prices of fresh tomatoes used by the peeled tomato industry decreased considerably in Campania region from 45 Lire to 38 Lire per kg, those in Emilia were lower at around 25 Lire during the period under review.

It was reported that during 1967 prices were generally favourable to growers in the case of contracted tomatoes, owing to the standing policy of the canneries to be more liberal on quality standards and tolerance limits during the lean years of output. In 1967, production of canners was considerably affected by the delay in maturity of tomatoes which resulted in shorter working seasons.

Major canneries in Italy normally enter into regular contracts with the growers both in Northern and Southern Italy for the purpose of ensuring regular supplies of processing varieties of tomatoes. According to these contracts which are entered into by most of the leading canners operating in Italy, quantities and varieties to be grown are pre-determined by the canners. Prices, however, are paid according to those prevalent at the time of harvesting.

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[11] National Institute of Preserved Foodstuffs, Rome.

Export Prices. An idea of the FOB prices quoted for major tomato products in various pack sizes in the Italian market during February 1968 can be had from the following table:

FOB Prices of Italian Tomato products

(Lire)

	200x2½oz	100x5oz	48x14oz	24x30oz	6x5 kg	72x8½oz
Concentrated Tomato Puree 18-20%	8.76	7.56	8-04	7.56	9.12	-
Concentrated Tomato Puree 28-30%	10.08	8.76	9.84	9.36	11.16	-
Concentrated Tomato Puree 35%	10.92	9.72	11.20	10.68	14.16	-
Peeled Tomatoes	-	-	7.20	6.75	-	7.44
Tomato Juices	5.64 (95x5½ oz)	-	4.62	4.08 (24x28 oz)	-	-

Spain

Production. Out of the aggregate Spanish production of 1.3 million tonnes of fresh tomatoes in 1966, about 30% was processed for the manufacture of different products. Production has been rapidly stepped up from 76,375 tonnes in 1963 to 108,555 tonnes in 1965, reflecting an increase of over 42% during the period. Tomato concentrates accounts for about 80% of the total manufacture of tomato products, followed by tomato catsup.

Exports. Approximately 80% of the total production of tomato products are consumed locally, the remaining being directed to export markets including West Germany, UK, France, Philippines, and Senegal. Exports of tomato products, mainly concentrates, have risen markedly from 10,728 tonnes in 1963 to 24,658 tonnes in 1966. The Spanish Government is very keenly interested in the further development of its concentrates industry and approximately 12% of FOB value is reimbursed to the exporters by way of drawbacks. It is believed that Spanish exports will continue to multiply in the coming years.

Development. The future horticultural development of Spain is expected to centre around Seville and Badajoz areas in the South West part of Spain. The Government had already formulated 'Plan Badajoz' with the objective of providing irrigation to a total area of 120,000 hectares, half of which has already been covered. These two valleys have excellent soils and climate for growing fruit and vegetable crops and are likely to be the most important future tomato growing areas. The field yield now obtained in these areas is reported to be 22 tonnes of tomatoes per hectare as against the national average of 15 tonnes. There are already 7 processing units operating in these areas producing mainly tomato concentrates. It is envisaged that more units will be established here in the near future resulting in considerable rise in production and export of tomato products.

Majority of canneries in Spain negotiate contractual arrangements with the growers for ensuring regular supply of quality fresh tomatoes for processing purposes. The quantities, varieties and prices of the tomatoes required by the canneries are pre-determined so as to ensure regular supply as well as guaranteed prices to the growers.

Greece

Production. The Greek tomato products industry registered a rapid growth during the last few years, indicating an output of 16,100 tonnes in 1965 as against an average of 8,000 tonnes during 1960-65. Production of fresh tomatoes is wide-spread with small farms scattered all over the country. Approximately 10-15% of the total fresh produce grown in the country is utilised by the industrial sector. The manufacture of tomato products during 1963-65 was as follows:[12]

(Thousand Tonnes)

	1963	1964	1965
Tomato Paste (20-30° brix)	9.5	10.7	12.3
Peeled Tomatoes	1.8	1.8	3.8

With the recent establishment of modern units in the Kos area, about 25 canneries are currently manufacturing tomato products in Greece. Their export effort has so far been negligible owing mainly to high costs and low quality products. With a view to strengthening their competitive position in world markets, the Government of Greece has since recently been granting cash subsidies for export of tomato paste of 28.32° at the rate of 2.90 Drachmas per kg., and for concentrates of 33-36° at 3.20 Drachmas and for over 36° at 3.40 Drachmas.

The industry is currently faced with serious problems in respect of the procurement of fresh tomatoes in the absence of a proper system ofcontractual arrangements between growers and canners. The industry has thus to depend upon fresh markets, where only low quality crops, not suitable for sale in fresh form, are normally available resulting in inferior product and high prices to the industry. Moreover, the production of fresh tomatoes is not undertaken in large farms, thus rendering the procurement of quality supplies difficult. However, one leading cannery has recently taken the initiative of entering into a contract with a group of farmers, which is likely to pave the way for growing rapport between growers and canners.

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[12] Ministry of Agriculture, Greece

Exports. Exports of tomato products of Greece have slowly risen from 3,899 tonnes in 1965 to 4,692 tonnes in 1967, mainly due to government subsidies. They however continue to face stiff competition in terms of price and quality from Portugal and Bulgaria. Exports from Greece are mainly directed to UK, Lebanon and Iraq. With the increasing application of modern techniques of mechanical harvesting and processing on the one hand, and the growing rapport between growers and canners on the other, the Greek industry is likely to expand exports in the next five years.

Industry in India

Against the background of about 42,000 hectares under tomato cultivation and an average annual production of 500,000 tonnes, processed items mainly comprising catsup and juice was of the order of 10,360 tonnes in 1967. Tomato concentrates as understood in the European market and whole peeled tomatoes are not presently manufactured in India.

Prospects for India

The market size of all tomato products in the Survey countries aggregated to 238,000 tonnes in 1966. The Survey has revealed that the demand potential of quality products would be substantial in the years to come, especially tomato concentrates and whole peeled tomatoes. Besides, the demand for tomato-based items like catsup, beans and canned fish in tomato sauce, is expected to grow more and more rapidly. The consumption of sauces and condiments, where tomato constitutes an essential ingredient, is also showing an upward trend.

It is in this field that India has great scope, provided the tomato industry is given a positive export orientation and rendered competitive. On the basis of the Survey, it is envisaged that exports of Indian tomato products could reach the level of 15,000 tonnes by 1975-76, comprising 10,000 tonnes of tomato concentrates and 5,000 tonnes of whole peeled tomatoes.

C. Recommendation

With a view to establishing a viable industry to reach the export level envisaged above, following steps are recommended:

1. A technical study of the American and Italian tomato processing industries should be urgently undertaken to draw lessons for determining the lines on which the Indian industry should develop.
2. A feasibility study should be subsequently made covering various aspects including selection of suitable varieties, identification of areas of development, arrangements for supply of fresh tomatoes to the processing units by developing farms on corporate/cooperative basis, and determining the number, areas and location of new processing units in suitable centres.
3. Based on the above studies, a comprehensive and integrated development programme should be formulated.

5.12 OTHER VEGETABLES

A. Fresh Vegetables

Background

International trade in fresh and processed vegetables is registering a steep rise in recent years as is evidenced by the European trade in these items. Imports of fresh vegetables into European countries rose from 2.9 million tonnes in 1964 to 3.5 million tonnes in 1966 while the corresponding rise in processed items was from 90,000 tonnes to 100,000 tonnes. The trend in South-East Asian and West Asian countries is also not dissimilar.

In keeping with the rising demand in the Western markets, many countries in the Mediterranean, North African and South Asian regions have developed an export-oriented vegetable industry mainly for catering to the European markets. Israel, which is air-freighting 150 tonnes of assorted fresh vegetables daily to the European markets, is a case in point. Taiwan's exports of processed vegetables amounting to $ 56 million per annum realised over the past five years are no less spectacular. Thus, countries like Israel, Jordan, Lebanon, UAR, China (Mainland), Taiwan and Japan are already well on the way of becoming major supplying countries to the world markets.

India, on the other hand, with an annual average production of 1.2 million tonnes of vegetables (excluding potatoes, tomatoes and onions) is yet to enter the international vegetable trade in a big way. During 1967-68, India's exports of these items were reckoned at 2,169 tonnes with fresh vegetables accounting for 1,657 tonnes and processed items, 512 tonnes. It is against this background that an attempt has been made to evaluate the prospects for Indian fresh and processed vegetable exports in the following paragraphs.

1. CAULIFLOWERS

Background

The curd, which is an immature abnormal inflorescence consisting of a closely packed mass of buds is the marketable part of cauliflower. In good quality specimens the curd is expected to be compact, with a deep rounded even white or creamy surface without any evidence of separate flower buds. The branches of inflorescence, further, are to be short, thick and tender with a solid whole head.

Varieties. Cauliflowers are classified according to the period of maturity, that is whether they come to harvest in winter or summer season. Most common of these varieties are:

Winter varieties:	Gigante de Napoli, Demi-Actif
Summer varieties:	Primaticcio di Toscana, Precoce de jesi, Cavolifiore Pisano

Production and Trade

West Europe. World production of cauliflowers was estimated at about 2.5 million tonnes during 1965. Italy, Netherlands and France were the largest producing and exporting countries while West Germany, Sweden, Switzerland and UK were the major importing countries in the world. The following table indicates the cauliflower consumption pattern in selected European countries for 1964-65 (average).

(See next page)

Apparent Consumption of Cauliflowers in[1] Selected European Countries
(1964-66 average)

(Thousand Tonnes)

Country	Production	Imports	Exports	Apparent Consumption	Per capita Consumption kg/year
Italy	650.0	-	120.0	530.0	10.6
France	340.0	6.5	65.0	281.0	6.0
Belgium-Luxemburg	50.0	12.0	8.5	13.5	5.6
Netherlands	50.0	19.0	8.5	60.5	5.2
UK	220.0	30.0	-	250.0	4.7
West Germany	66.0	120.0	-	186.0	3.4

Demand for imported cauliflowers in the European markets is confined mainly to winter months, which is usually met by intra-European trade. Imports from non-European sources are a rare phenomenon.

West Asia & South East Asia. Malaysia and Singapore in South-East Asia, and Kuwait and Bahrain in West Asia are the major importers of cauliflowers. Total imports of these markets range between 25,000 to 30,000 tonnes per annum. The principal suppliers to Malaysia and Singapore are China (Mainland) and Taiwan, while Lebanon and Jordan cater to Kuwait and Bahrain markets. Average cif prices ranged from $ 0.15 to $ 0.25 per kg during January, 1968.

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[1] Le Chou-fleur, Dossier Economique, CTIFL, Paris, 1967.

India's Position

With an annual average production of 413,240 tonnes, India may be considered as one of the leading cauliflower producing countries of the world. Area under this crop was estimated at 38,160 hectares in 1961-62 with Uttar Pradesh, Mysore and West Bengal constituting the principal centres of production. Main varieties cultivated include Kunwari, Early White, Indian Snowball, Holland No. 6 and Agahni. Information relating to varietal characteristics and statewise distribution of are and production is furnished in Volume II, Annexures A-15 and A-18 of the Report.

Prospects

Cauliflower exports placed just at one tonne during 1967-68 indicates that India has not attempted so far to export this item. Survey revealed that importers in Malaysia and Singapore in South East Asia, and Kuwait and Bahrain in West Asia are willing to import this item from India. A market for 200 tonnes can be built-up by 1975-76 if India could tap these markets. Cauliflower consignments have to be sent by refrigerated ships.

2. CABBAGES

Cabbage is a hard biennial crop, although in most countries it is grown as an annual crop. The terminal buds comprising leafy material and belonging to the family of Brassica Oleraeae Var. Capitata L. is a much sought after vegetable in both the hemispheres. Cabbages are called Red, White or Green depending upon the colour of the leafy material.

World Production and Trade

World production of cabbages was estimated at 13.8 million tonnes during 1965. USA, Japan, Poland and West Germany were among the important producing countries in the world as is evident from the table given below:

Production of Cabbages in Selected Countries 2/

(Thousand Tonnes)

	1963	1964	1965
France	396	341	372
West Germany	554	513	421
Poland	1,574	1,467	1,794
USA	1,187	1,295	1,418
Japan	3,035	2,724	3,163

West Europe. Data relating to international trade in cabbages are not published. Information available on the Survey countries indicates that Netherlands, France and Italy comprise the major exporting countries in Europe and their annual exports average at 50,000 tonnes. Major importing countries are West Germany, Sweden, UK and Switzerland. Imports are effected usually during the winter months.

2/ FAO Production Year Book, 1966.

West and South East Asia. Singapore and Malaysia annually import about 15,000 tonnes of cabbages from China (Mainland), Taiwan and Australia. West Asian countries (Kuwait & Bahrain) secure their requirements of cabbages amounting to about 5,000 tonnes per annum from Lebanon and Jordan.

India's Position

Production of cabbages in India estimated at 288,000 tonnes accounts for about 5.2% of the total cole crop production. West Bengal, Uttar Pradesh, Assam, Punjab and Maharashtra are among the important states producing cabbages. Total area under this crop in the country was estimated at 21,390 hectares during 1961-62. Varieties under cultivation in India include:

Early varieties:	Golden Acre, Early Drum Head, Pride of India, Copenhagen Market and English Ball
Mid Season and late varieties:	Late Drum Head, Glory of Enkuizen, Sure Head, Danish Ball Head.

Prospects

Though India's exports of cabbages amounted only to two tonnes during 1967-68, opportunities for increasing their exports to South-East Asian and West Asian markets are reportedly promising. They may well reach a level of 200 tonnes per annum by 1975-76 if Indian exporters can ship this item at competitive prices (that is $ 0.15 to $ 0.20 per kg c.i.f. Singapore) and in ventilated ships on a regular basis.

3. FRENCH BEANS

World Production and Trade

World production of French beans was estimated at 2.3 million tonnes during 1965. USA, Italy, France, Spain and Belgium/Luxemburg were the main producing countries. In recent years, other Maditerranean and North African countries have taken to French beans cultivation in view of the growing demand for this item in Europe, round the year. European season lasts only for about six months that is from June to November. During the remaining months European requirements are met by imports.

Production of French Beans in Selected Countries 3/

(Thousand Tonnes)

	1963	1964	1965
France	140	146	135
Italy	233	248	248
UK	·64	74	68
USA	622	615	674
Spain	92	154	127
Japan	72	76	75

3/ FAO Production Year Book, 1966.

While the total quantum of French bean imports into European countries may be placed at 45,000 tonnes per annum, their off-season, imports together could be estimated at well over 15,000 tonnes. Between June and November, European French bean requirements are met by domestic production combined with Italian and French supplies. From November to May imports mainly originate from UAR, Morocco, Senegal and Kenya. Of the three important varieties of French beans marketed in Europe - Princess, Wade and Borlotto - the most sought after variety is Princess.

Importers in Europe are very rigid about French beans quality requirements. They expect the beans to arrive with clean fresh appearance, firm but tender and crisp, and absolutely free from wilting, scars and diseased tissue. There is preference for narrow straight pods with no outward sign of seed development and are accurately graded for size. The beans must be free from stringyness so that the colour of the bean is retained even after cooking. French beans are usually air-freighted packed in 3 kg or 5 kg. ventilated cardboard cartons. A few exporters (notably from Ethiopia and Morocco) have used cartons with cellophane windows in an attempt to produce a more attractive pack. Beans from Italy and Spain come overland and are normally packed in wooden crates. Unless French beans are packed in perfect dry conditions, they are liable to get overheated in the cardboard cartons resulting in serious damage due to the development of diseased and mouldy pods.

Average c.i.f. prices during winter season in European markets are reported to range from $ 0.70 to $ 0.80 depending upon the source of supply. Highest prices are quoted for Kenyan and Moroccan beans.

Prospects

Production of french beans in India is carried on a limited scale. It is estimated that annual output averages at 23,450 tonnes. Andhra Pradesh, Gujarat, Mysore, Maharashtra and Madras are the principal producing states. India, at present, does not export French beans.

Considering that french beans are harvested between October and January in India and that prices compare favourably with those of other supplying countries, it is suggested that India should explore the possibility of air-freighting this item on a weekly basis to the European markets.

4. GARDEN PEAS

Garden peas are extensively cultivated in many parts of the world. During 1965, world production was estimated at 3.3 million tonnes. Major pea producing countries in the world were USA, UK and Italy (see table below):

Production of Garden Peas in Selected Countries 4/

(Thousand Tonnes)

	1963	1964	1965
France	324	335	290
Italy	220	216	231
UK	434	513	410
USA	1,180	1,110	1,373
Japan	69	99	101

4/ FAO Production Year Book, 1966.

Garden peas are broadly classified into two groups, smooth seeded and wrinkle seeded. Smooth seeded varieties are early varieties. They germinate better, and are reported to be hardier and resistent to fungus diseases. In the wrinkle seeded varieties pods are sweeter, bigger, with better flavour. The wrinkled varieties are preferred for canning. Most important international pea varieties are: Resistent Early, Perfection 326, Little Marvel, Precoceo di Provenza O and Quarantino.

Most of the European countries produce their fresh pea requirements locally. West Germany alone imports about 2,500 tonnes of fresh peas per annum from Italy and France. West Asian countries mainly secure their pea supplies from Lebanon and Jordan.

India's Position

Although garden peas are grown in almost all parts of the country, Uttar Pradesh with 16,900 hectores is by far the most important pea-growing state in the country. Total area given over to this crop in India is estimated at 38,120 hectares with an average annual production of 170,710 tonnes. Some of the main varieties of peas grown in India are: Little Marvel, Simla, Early Badger, Lexton Progress and Early Giant. Statewise distribution of area and production and the varietal characteristics of peas grown in India are respectively indicated in Volume II Annexure A-18 and A-13 of the Report.

Prospects

Importers in Kuwait and Bahrain indicated their willinguess to import fresh peas from India on a regular basis. Pea consignments to these markets have to be air-freighted.

5. MUSHROOMS

Mushrooms are called white or black depending upon the colour of the fungi. Champinigon de Paris, a white variety, is considered the best of mushrooms. France, Netherlands and Belgium are the major producing and exporting countries of cultured mushrooms in Europe. Their combined production of white mushrooms was estimated at 28,000 tonnes in 1966.

International trade in fresh mushrooms is gradually declining in view of the fact that it has become possible to raise cultured mushrooms at every household cellar in Europe. Current imports are mainly confined to quality varieties or canned mushrooms. For fresh mushrooms, West Germany continues to be the largest market followed by Switzerland, Sweden and UK.

Position in India

Cultured mushrooms are not raised in India. Black mushrooms, however, (Morchella Esculanta) are found in woody forests of Jammu and Kashmir at an altitude of 5,000 to 7,000 ft, main areas of occurrence being Kishenganga drainage, Jhelum Valley division, Kamaraj division and Pir Panjal division in Kashmir province and Udhampur division and Upper Chenab drainage in Jammu province.

Average annual production of dried black mushrooms in Jammu and Kashmir is estimated at 40 tonnes, bulk of which is obtained in April. After collection, the morels are dried in the sun and in this process weight is reduced from one pound to one ounce. During the season, the price of wet mushrooms is generally between Rs 3 and Rs 5 per kg. but after sun-drying prices go upto Rs 60 per kg.

Dried mushrooms are presently exported in bulk to France and Switzerland. During 1966-67, total exports of mushrooms amounted to 34 tonnes valued at Rs 2.5 million.

Mushroom industry in Jammu and Kashmir is being run at present on cottage scale basis and techniques of collection and processing are inadequate to meet export market requirements. The main problem to be tackled in this connection relates to evolving suitable methods of production of black mushroom on a commercial scale, as experiments conducted in this respect have not proved successful so far.

Prospects

India does not cultivate white mushrooms of the Champinigon de Paris' variety. It is reported that an FAO expert is already working with ICAR to suggest measures for developing the white mushroom cultivation in India.

Taking into account that international trade in fresh mushrooms is declining and the trade in canned mushrooms is rapidly increasing, it will be worthwhile if India concentrates on the raising and canning of white mushrooms. Suitable technical studies need to be undertaken on urgent basis in the country with a view to developing appropriate methods of growing cultured mushrooms.

6. GREEN CAPSICUMS

Green capsicums, (Capsicum Annums) regarded as a speciality item for many years, are becoming a popular vegetable in the European markets mainly because of the vigorous promotional campaign undertaken by Israel and Italy. They are now being demanded by the European consumers round the year.

France, Spain, Italy and Yugoslavia are the principal producers of capsicums in Europe. Their combined production was around one million tonnes during 1966. Other important producers include Israel, Ethiopia, Kenya and Uganda. Most popular commercial varieties of capsicums marketed in Europe and Californian Wonder, Oakview Wonder, Di Nocera and Di Asti.

European countries are estimated to absorb 60,000 tonnes of fresh capsicums per annum of which more than 80% is accounted for by West German and UK imports. France, Belgium-Luxemburg and Switzerland are the other important buying countries.

While Italy, Spain and Netherlands supply capsicums to the neighbouring countries during the July-October period, the off-season supplies principally originate from Israel followed by Ethiopia, Kenya and Uganda. It is reported that both Spain and Italy are planning to increase the production of early season capsicums with a view to capturing the remunerative late spring markets.

Mediterranean and North African capsicums arrive in the European markets by air packed in 5 kg. cardboard cartons. Average c.i.f. prices quoted during January 1968 ranged between $ 0.70 and $ 0.80 per kg.

India's Position

Though no production estimates of green capsicums are available in India, it is believed that the output of this item is fairly sizeable. In view of the ready markets available, especially in Germany, Switzerland and France, suitable marketing arrangements should be made for tapping this potential.

7. ARTICHOKES

Artichokes are mainly cultivated in France, Italy and Spain and to a lesser extent in Algeria, Morocco and Tunisia. Annaul average production of these countries together is reported to be around 8,00,000 tonnes per annum. Violetto Bolognesse is the principal variety preferred by the French consumers.

France, inspite of being one of the largest producers, imports about 40,000 tonnes of artichokes mainly from Italy and Morocco. Outside France, only a few thousand tonnes are sold in

Belgium, Switzerland, Austria and Germany. Otherwise, production and consumption of this item are essentially restricted to the southern European and North African countries.

Considering that Mediterranean countries can fully meet the European market requirements of fresh artichokes, there is hardly any scope for India to market this item at present. On the other hand, India should attempt to export canned artichoke hearts in view of the growing demand for this item in the European markets. It is reported that areas in Punjab and Mysore are eminently suited for cultivating artichokes of very good quality. It is therefore suggested that possibilities of growing artichokes on a commercial scale for the purposes of canning them should be examined on urgent basis.

8. OKRA

Okra (Lady's fingers) which belongs to the family of Hibiscus Esculentus is well known as an Asiatic vegetable in the European markets. Clemen Spineless and Perkin Spineless are the two most important varieties of okra. Bulgaria, Hungary, Yugoslavia, Cyprus, Greece, Turkey, and North African countries are the major okra producing countries in the Mediterranean region.

It is reported that European imports of okra fluctuate between 500 to 800 tonnes per annum, UK absorbing more than 60% of the total imports. Main suppliers are Greece, Cyprus and Bulgaria. India is also a major supplier of okra to the UK market.

Small sized pods, approximately of 2" to 4" in length, are preferred in these markets. The pods should snap easily when broken, indicating that they are fresh. Okra is usually air-freighted to European markets packed in 3 kg. cardboard cartons. Average cif prices quoted in UK during January 1968 were around $ 0.40 to $ 0.50 per kg.

The extent of okra imports into West Asian and South East Asian markets poses problems of estimation. Survey findings, however, revealed that there is a ready demand for this item in these markets.

Considering that India is already exporting this item to UK and that Indian okra fetches a premium price in that market it would be profitable if export operations are extended to the other countries in Europe. West Asian and South East Asian markets should also be tapped for this item.

9. AUBERGINES

Switzerland, West Germany, UK and Netherlands constitute the major importers of aubergines in West Europe. West German imports average at 1,000 tonnes per annum.

Israel, Bulgaria, Italy and Ethiopia are the main suppliers to these markets. Survey revealed that consumers in Europe prefer aubergines of the 'long dark' and 'round violet' types respectively called as Lunga Vilotta and Black Beauty. Average c.i.f. prices in these markets ranged between US $ 0.60 and US 0.65 $ per kg in January 1968. Aubergines from Israel are-freighted.

Considering that India produces a wide variety of aubergines including the above mentioned varieties and that the European prices are comparatively attractive, it should be possible for exporting this item to the European and West Asian markets, round the year.

10. TINDA, PARAWAL AND KARELA

Tinda, Parawal and Karela are cultivated on commercial scale in Uttar Pradesh, Punjab, Gujarat and Maharashtra. No data on the area and production of these vegetable crops are available. As regards exports, it is estimated that about 750 tonnes of these vegetables valued at Rs 6 million are annually despatched abroad. In view of their exotic appeal, these vegetables may find favour among a section of the foreign consumers. Attempts will have to be made to introduce and popularise these vegetable in fresh or processed form in the overseas markets.

11. YAMS

UK and Netherlands are the major importers of yams in Europe and are supplied mainly by South Africa. Imports into U.K. were placed at 500 tonnes in 1966 and that of Netherlands at 50 tonnes. Average c.i.f. prices were reported to be $ 270 per tonne in 1967-68.

In view of the vast production-base available in India, efforts should be made to seek opportunities for exporting yams to UK, particularly.

B. PROCESSED VEGETABLES

Canned vegetables, soups & sauces and pickles & chutneys are the most important processed vegetable items. Though all these items enter into the international trade in varying quantities, canned vegetables account for bulk of international trade. Total imports of processed items into the Survey countries during 1966 were of the order of 100,000 tonnes.

Canned Vegetables. Mushrooms, asparagus, peas, beans and macedoine (mixed vegetables) are some of the canned vegetables which figure prominently in the international trade. European imports of these items may be placed at 70,000 tonnes during 1966 with mushrooms and asparagus accounting for 30,000 tonnes each and peas for the reminder. Italy, France and UK were the most important suppliers of mixed vegetables, canned peas and mushrooms, the principal importing countries being West Germany and the Scandinavian countries.

Taiwan has become the largest supplier of quality canned asparagus to European markets in recent years. In about a period of five years, her exports of this item, both tips and cuts, have increased from $ 4,000 in 1963 to $ 14.2 million in 1966.

Soups and Soup Powders. International trade in these items is limited to a few speciality types. Otherwise most of the countries produce their requirements locally.

Pickles and Chutneys. Except for speciality pickles and chutneys made of tropical vegetables like mango pickles or lime pickles, all the items falling under this category are supplied from domestic sources. There is no significant trade in these items.

India's Position

During 1966, production of canned vegetables in India was of the order of 2,346 tonnes with peas, carrots and cauliflowers accounting for more than 65% of the total output (see table below):

(Contd. next page)

Production of Canned Vegetables in India

(Tonnes)

	1964	1965	1966
Peas	780	1136	975
Carrots	420	500	390
Cauliflowers	180	200	270
Tomatoes	280	430	80
Karela	186	489	40
Cabbage	147	200	30
Parwal	168	200	135
Cabbage, curried	17	96	34
Baked Beans in Tomato sauce	140	420	120
Kundri	125	120	110
French Flat Beans	155	250	110
Tinda	202	505	70

Vegetable canning in India mainly caters to the defence requirements as both civilian consumption and exports have not yet reached significant levels. Canned vegetable exports, in fact, have fallen steeply to 48 tonnes in 1967-68 from 118 tonnes in 1965-66. Main market for Indian canned items in UK and small quantities are despatched to the West Asian markets as well. Tinda, parawal, karela and baked beans in tomato sauce are the main items of export.

Pickles and Chutneys. India produces a variety of pickles and chutneys most important among which are mango, limes and goosebery pickles and mango chutney.

During 1966, their production was estimated at 17,000 tonnes. Pickles and chutneys figure prominently in India's exports. Dring 1967-68, exports of these items were of the order of 1,757 tonnes (Rs 5.5 million) mainly directed towards UK market.

Prospects

India has the requisite resource-base to produce and export the processed vegetable items on a large scale. Market opportunities are also not lacking, for the European and Asian countries are increasingly importing processed speciality items from distant sources. And in the field of pickles & chutneys, India's position continues to be unique. Large scale expansions in processed vegetable exports therefore calls for an effective production programme within the country and suitable marketing arrangements in the overseas markets. India should be able to reach an export level of 10,000 tonnes by 1975-76, if a bold programme of action is implemented.

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